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MISSION
SAFETY

70

RECLAMATION SAFETY NEWS



PX-D-53383

First Quarter 1966

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MAY 18 1966

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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Safety Performance Record

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Front Cover Photo: Safety awards earned over the years by the Kansas River Projects form a symbolic background for this photograph of Ralph C. Meager on the occasion of his retirement from Reclamation. Ralph's career with Reclamation is synonymous with outstanding achievement in safety. During the 18 years that he served as the Kansas River Projects' Safety Officer, the project was presented 20 Department of the Interior Certificate of Safety Achievement Awards, representing a total of 10 million man-hours without a disabling injury--A record unequalled by any other operating office in Reclamation. Mr. Meager's personal dedication and achievement in the cause of safety, both on and off the job, has been highly beneficial to both the Government and the community.

First Anniversary Mission Safety 70

President's Statement of February 16, 1966 INTERIM REPORT BY THE SECRETARY OF LABOR ON FEDERAL EMPLOYEE SAFETY PROGRAMS

One year ago today I called upon this Administration's Department and Agency heads to reduce the number and cost of injuries to Federal employees 30 percent by 1970.

Since then more than 50 agencies have surveyed their safety problems and developed plans for resolving them.

The first year of Mission SAFETY-70 brought widespread and increased attention to safeguarding those who serve their country in the civilian service of the United States. This is as it should be—there must be constant and vigilant concern for the welfare of the men and women who serve their Nation in the Federal service.

But there can be no let up. I have today requested¹ the heads of all agencies to continue and intensify their efforts and to send to me, by May 1, a summary report of their safety actions and their plans.

Secretary of Labor Wirtz has given me an interim report of some 1965 highlights:

- . . . We have reduced from 5 to over 20 percent the injury frequency rates in a number of larger Federal agencies including the GENERAL SERVICES ADMINISTRATION, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, TENNESSEE VALLEY AUTHORITY, AGRICULTURE, HEALTH, EDUCATION, AND WELFARE, JUSTICE, INTERIOR, VETERANS ADMINISTRATION, AND D.C. GOVERNMENT. These improvements took place in the 9 months immediately following the launching of Mission SAFETY-70.
- . . . We have reduced disabling injuries in thirteen of the 19 largest agencies and preliminary figures indicate a 2.4 percent reduction in the overall Federal injury rate.
- . . . In the ATOMIC ENERGY COMMISSION we reduced its already low frequency by 30 percent and its private contractors reported a 22 percent reduction last year.
- . . . SHARPE ARMY DEPOT near San Francisco, a growing supply link to our fighting forces in Vietnam, reduced its injury frequency over 50 percent in the last 6 months of 1965. As its 3,000 civilian employees entered their February work schedules, they had completed 158 days without a disabling injury.
- . . . THE AIR FORCE reports a 19 percent reduction in motor vehicle fatalities last year, reaching its best accident prevention record since 1950.
- . . . Three DEPARTMENT OF TREASURY units reduced their injury frequency from 20 to over 30 percent. When injuries rose following round-the-clock production of new coins, the U.S. MINT re-evaluated and upgraded its safety program.

These examples demonstrate that waste in manpower and resources can be reduced and must be attacked relentlessly. Agency efforts separately, and jointly with the Federal Safety Council, have given strength and meaning to Mission SAFETY-70.

¹ F.R. Doc. 66-1959 *supra*.

I congratulate and commend all agencies on their achievements during the first year of Mission SAFETY-70, but, as we enter the second year of this long-range program to cut the number and costs of accidents, our course is clear.

We must see that our Federal programs bear fruit and stimulate greater safety efforts throughout our Nation and in every community.

On this, the first anniversary of Mission SAFETY-70, I again call upon Federal administrators and employees to provide the necessary leadership and that full measure of support so essential to success.

THE WHITE HOUSE
February 16, 1966.

Lyndon B. Johnson

BUREAU ACHIEVEMENT: 22 percent reduction in disabling injuries involving Bureau of Reclamation personnel during 1965.

* * * * *

SECOND NATIONAL DRIVERS' TEST--MAY 24

On Tuesday, May 24, 1966, the CBS television network will present the second in its series of National Drivers' Tests. The first program in the series was seen in May 1965 and again in August 1965.

The color broadcast will be seen at 10 p.m. Eastern and Pacific times and 9 p.m. Central and Mountain times. Check your local newspaper for exact time.

The test has been completely revised to illustrate brand new driving situations with the use of specially prepared film sequences.

Test forms will be printed and distributed by Shell Oil Co., sponsor of the show.

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BUREAU SAFETY PERFORMANCE

1966 CUMULATIVE SAFETY RECORD
January 1 - March 31, 1966

A. GOVERNMENT FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Alaska District	0.0	0.0	0	0.0
Region 3	0.0	0.0	0	2.6
Region 2	0.2	0.9	22	2.0
Region 7	2.9	4.6	63	2.5
Region 5	5.1	6.1	84	4.6
Region 6	8.7	7.7	113	5.0
Region 1	16.4	9.4	175	4.6
Region 4	133.4	1.5	8,894	3.1
Totals to date	35.9	3.2	1,121	3.3
Totals 1965	7.4	2.8	264	2.9
Job Corps Conservation Centers:		6.9	41	23.9

B. CONTRACTOR FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 7	0.0	0.0	0	0
Region 2	1.2	3.1	40	0
Region 6	3.7	6.8	54	0
Region 1	79.5	23.8	334	0
Region 3	96.7	17.0	569	0
Region 4	276.5	17.4	1,589	0
Region 5	3,712.0	21.3	17,427	2
Totals to date	497.8	11.3	4,405	2
Totals 1965	531.7	14.3	3,718	8

*Injury index is equal to frequency rate times severity rate divided by 100.

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1966
First Quarter

Cumulative to Date:
March 31, 1966

A. ACCIDENT CLASSIFICATION:

<u>Type</u>	<u>Description</u>	<u>No.</u>	<u>Days lost</u>
5	Vehicles	2	36
9	Electricity	1	6,000
12	Handling materials and equipment	6	86
13	Falling objects	1	19
14	Falls of persons	5	124
17	Flying particles	1	5
18	Handtools	1	8
19	Machinery	1	4
		<u>18</u>	<u>6,282</u>

B. OPERATIONAL SUMMARY:

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration,					
Clerical and					
Design	2,182,764	2	8	0.9	4
Construction	1,289,096	3	55	2.3	43
Investigation	611,163	3	41	4.9	67
Power O&M	844,775	8	6,122	9.5	7,247
Irrigation O&M	676,922	2	56	3.0	83
Totals	5,604,720	18	6,282	3.2	1,121

C. SERIOUS ACCIDENT:

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
1-11-66	Foreman III Lineman	Electric power burns	6,000 (non-fatal)

SAFETY AWARDS

NATIONAL SAFETY COUNCIL'S AWARD OF HONOR

The Bureau of Reclamation has won the National Safety Council's highest award--the Award of Honor--for the third consecutive year.

For outstanding safety performance during 1965, the following Regions of the Bureau also have been selected to receive the National Safety Council's Award of Honor:

Region 2--Sacramento, California
Region 3--Boulder City, Nevada
Region 4--Salt Lake City, Utah
Region 5--Amarillo, Texas
Region 6--Billings, Montana

This is the fourth consecutive year in which Region 5's safety record has merited the Award of Honor.

REGION 6 WINS COMMISSIONER'S SAFETY AWARD

Commissioner Dominy presented the Commissioner's Annual Safety Award for 1965 to Regional Director Harold E. Aldrich at the budget review reception held during the first week in March. In achieving the best safety record of the year, Mr. Aldrich's Region 6--with headquarters at Billings, Montana--attained an injury index rate of only .02 and employees suffered only two disabling injuries while working 1,735,815 man-hours. With only two lost-time injuries during 1965, Region 2 was a close contender for the award.

Also at the brief award ceremonies, Commissioner Dominy presented Safety Achievement Awards to Regional Director R. J. Pafford, Jr., for safe driving achievement by Region 2 employees of the Shasta and the Tracy Field Divisions, and to Regional Director H. P. Dugan for safe driving by Region 7 employees of the Fryingpan-Arkansas Project.

For the fifth consecutive year, Reclamation achieved the lowest accident frequency rate in its history. During 1965 not a single Bureau employee was fatally injured as a direct result of Reclamation operations: The first "fatality free" year since 1938, when accident statistics were maintained.

DEPARTMENT OF THE INTERIOR
CERTIFICATE OF SAFETY ACHIEVEMENT AWARD

Employees of the Parker-Davis Project, Phoenix, Arizona, received the Department of the Interior Certificate of Safety Achievement last fall after working one million man-hours without a disabling injury.

Pictured below are the Project Manager and members of the Project Safety Committee. Seated, left to right: W. D. Thomas, Chief, Transmission Division; O. K. Mangum, Project Manager; J. D. Earl, Chief of Administrative Division and Committee Chairman; (standing) Dale B. McIntire, Chief, Transmission Line Branch; A. K. Dolyniuk, Chief, Design and Construction Division; Hubert S. Jerrell, Project Safety Officer. Members of the Safety Committee not shown: Earl Walters, Chief, Davis Dam Field Division, and Bruce Chadwick, Chief, Parker Dam Field Division.



As of March 31, 1966, employees of the Parker-Davis Project have worked 1,404,786 man-hours without a lost-time injury over a 2-year period. This is one of the best safety records in the history of Reclamation and reflects the dedication and abilities of the Project Safety Committee and Hubert S. Jerrell, the Project Safety Officer.

Safety Achievement Award--South Platte River Projects, Colorado:



Shown above are, left to right: James Kezer, Chief, Power O&M Division; George R. Highley, Project Manager; and Dan Winans, Regional Safety Officer, on the occasion of South Platte River Projects being presented with a Department of the Interior Certificate of Safety Achievement, earned by driving over 500,000 miles without a motor vehicle accident. As of March 31, 1966, the Project has accumulated 859,892 accident-free miles.

CONSTRUCTION SAFETY AWARDS

The A & B Construction Company of Helena, Montana, was presented the Bureau of Reclamation's Construction Safety Award in recognition of that Company's exemplary safety record during the reconstruction of Bynum Diversion Dam, Teton River, Montana.

The A & B Construction Company completed the work under its contract, totaling close to half-a-million dollars, with no lost-time injuries, despite the fact that it was necessary to perform a major portion of the work under unusually severe weather conditions.

The Bushman Construction Company of St. Joseph, Missouri, has recently completed four contracts with Reclamation with an accident frequency of "0" on each one.

Niobrara-Lower Platte Projects Manager Paul L. Harley is shown on the right following presentation of the Construction Safety Award to Leo F. Bonneau, Vice President of Bushman Construction Company, while Farwell Unit Construction Engineer J. T. Pyle looks on. The award was earned by Bushman's exemplary safety record in completing the Deer Station Pumping Plant with no lost-time injuries.



P707-729-3118

The Bushman Construction Company also has completed contracts, involving some 250,000 man-hours during the period September 1963 through December 1965, on the Farwell Unit in Nebraska without a single disabling injury



P662-525-4310

Bureau of Reclamation Construction Safety Award being presented to Orville Thornburg of Tco, Inc., White Deer, Texas, by Phil Kensley, Resident Engineer at Sanford Dam, Canadian River Project, Texas. The award was earned by Tco's completion of the Blue West road and boat ramp without a lost-time accident.

* * * * *

ACCIDENT REVIEW

TUNNELS

Activity: Bureau contractor--An underground chamber had been excavated to house the control gates and stilling basin in a tunnel. At the time of original excavation about 10 months earlier, the roof had been supported with 2- to 4-foot rock bolts. The contractor was in the process of cleaning up and "safety proofing" by placing longer rock bolts, metal lagging, and wire mesh to hold material that might spall or fall. Three employees on a scaffold were scaling loose rock and installing the rock bolts in the roof of the tunnel. A rockfall from the roof caused the scaffold to collapse, resulting in the three men being injured, one of them fatally.

Cause Determination: The fall of rocks from the roof caused the scaffold to fall, although the load and use of this scaffold were well within the safety factor limits for which it was designed. Probable contributing causes of the rockfall were prolonged exposure to the elements and water inundation.

Prevention: Closer inspection of rock in areas where men are working, continued review of the areas ahead and behind the working area, and use of stronger guy wires on scaffolds.

VEHICLES

Activity: Bureau contractor--A trackman jumped off a front-end loader into the path of a moving electric locomotive going in the same direction. Time lost: 6,000 days fixed charge for fatality.

Cause Determination: The employee was riding the equipment in an unsafe position and jumped off while the equipment was moving.

Prevention: A rider must be in the cab of a front-end loader and not allowed to board or get off moving equipment. Pertinent paragraphs of "Safety Requirements for Construction by Contract, Third Edition," read as follows:

"9-6. Getting off or on equipment such as vehicles, cranes, excavation equipment, etc., while in motion is prohibited."

"9-151. Under no circumstances shall any person be permitted to ride with arms or legs outside of a truck body, in a standing position on the body, or on running boards or seated on side fenders, cabs, cab shields, rear of truck, or on the load."

VEHICLES

Activity: Bureau contractor--An employee was driving an empty flat-rack truck down a grade. He was unable to get the truck into a lower gear and claimed the brakes were "soft," so he jumped from the vehicle and sustained numerous bruises. Time lost: 7 days.

Cause Determination: Possible mechanical failure of brakes; failure of driver to exercise precautions, such as shifting to a lower gear prior to starting down the grade.

Prevention: Continuous practice of defensive driving techniques. Paragraph 9-119 of "Safety Requirements for Construction by Contract" provides: "All vehicles shall be regularly inspected by a competent mechanic and maintained in safe operating condition by competent mechanics."

Activity: A man fell asleep in his personal automobile with the motor running. He was discovered unconscious a short time later, and the extent of his injuries is not yet known.

Cause Determination: The automobile had a faulty exhaust system and the man was overcome by carbon monoxide.

Prevention: Proper maintenance of automobiles, and running the motor only when there is proper ventilation.

HANDLING EQUIPMENT

Activity: Bureau contractor--Employee was cutting rough boards with an electric table saw without a guard when his left hand caught in the saw blade. His thumb was severed at the first joint and his left index finger was badly cut. Fixed charge for loss of distal phalange of thumb: 300 days.

Cause Determination: Use of power saw without guard; wearing gloves while using saw; improper setting of blade.

Prevention: Saws should be equipped with safety guards as provided in Paragraph 10-12 of "Safety Requirements for Construction by Contract," reading as follows: "Portable circular power saws shall be equipped with guards that automatically enclose the blades under all conditions. Cracked or defective blades shall not be used."

LIFTING

Activity: Bureau contractor--A miner was helping coworkers lift an armored electrical cable when his foot slipped. This resulted in torn muscles and a time loss of 21 days.

Cause Determination: Improper lifting.

Prevention: Instruction in, and practice of, proper lifting techniques.

HEAVY EQUIPMENT OPERATION

Activity: Bureau contractor--A lineman was attempting to move a man hoist further than rigging would allow. This caused the platform to "jolt" and threw him approximately 55 feet to the ground. Time lost: 60 to 90 days. Note: The excellent first aid administered by coworkers at the jobsite reduced physical shock and more serious complications.

Cause Determination: Improper positioning of crane, inadequate rigging, and poor communications.

Prevention: Development of better communications between the foreman and the man-lift operator. More attention given to positioning of crane and to the amount of cable available.

HOPPERS

Activity: Bureau contractor--Employee was unloading rock from a gondola railroad car, lost his balance, and slipped down the hopper chute, injuring the calf of his leg. Time lost: 4 days.

Prevention: Exercising of more caution by supervisors and employees to hazards connected with specific operations. Paragraph 12-40 of "Safety Requirements for Construction by Contract" states: "Employees required to work in hoppers shall be equipped with lifelines and safety belts."

ELECTRIC POWER BURNS

Activity: A Bureau line crew was changing insulators on an energized 138-kv transmission line. The work was being done with the use of hot-line tools under a hot-line hold order. In the process, a ball and socket joint between the insulator string and the conductor shoe separated, allowing the energized conductor to drop. The energized conductor fell across a line pickup and hot-line trailer parked under the line. The line foreman, who was leaning against the hot-line trailer, was severely burned when the conductor struck the pickup and trailer: Time lost: 6,000 days fixed time charge for permanent partial disability, including loss of left hand and foot.

Prevention: Vehicles and equipment should be kept out from under conductors or structures being worked on, particularly energized conductors during hot-line repairs. Employees should not unnecessarily stand beneath conductors, structures, and equipment under repair.

* * * * *

COPIED FROM FEATURE HISTORY OF THE SHOSHONE DAM
June 1, 1910

A Summary of Accidents

Reference to the diary will show the details of the large number of personal accidents of various sorts which unfortunately are a part of the record of this, like all other large public works.

Considering the unavoidably dangerous nature of the work done on this project, the great amount of rock excavated and tunneling involving the use of high explosives, the high and inaccessible cliffs which form the site of the chief operations, the complicated machinery used in doing the work, and the inclement weather during which the work was necessarily carried on, it is not surprising that there were frequent and serious casualties. And yet, again considering these circumstances, it is surprising that personal injuries were not even more frequent, and more commonly fatal as well.

It would be tedious and unavailing to recall here all the harrowing details of human suffering which occurred during the course of the nearly 5 years of work on the dam.

Suffice it to say that there were approximately a total of 41 serious personal injuries during this period.

Of these, 7 resulted in death; 3 resulted in the loss of limbs; 3 in the loss of sight; and 28 cases of minor crippling or mutilation.

All of these cases included were practically subjects for the surgeon or the undertaker. Besides these, there were innumerable instances of slight bruises, cuts, burns, and the everyday mishaps which do not find their way into the record because they do not prove to be disabling hurts.

* * * * *

NEW ADDITION TO DENVER FILM LIBRARY

"More Safely Tomorrow, " from the National Safety Council, projects a panoramic picture of the American business, governmental, and industrial complex; vividly underscores the need for accident prevention in the years ahead; and outlines the role of Mission SAFETY-70 in effectively reducing accidents in this decade.

Requests for loan of this 10-minute 16mm, sound-motion, color film for project showing should be addressed to the Chief Engineer's Office, Attention: Code 841.

* * * * *

FROM THE FIELD

Hungry Horse Project, Montana--Heads Lifesaving Group: Donald Voelker, Chief, Operation and Maintenance Division of the Hungry Horse Project, Montana, was elected new President of the Flathead Lifesaving and Rescue Association at the recent annual election meeting.

Fryingpan-Arkansas Project, Pueblo, Colorado--Safety Signs: The view pictured below shows the outlet portal of Chapman Tunnel, Station 157+72. Winston, Foley, Frazier-Davis, and Hurley is the contractor for construction of the Divide, South Fork, and Chapman Tunnels, diversion dams and appurtenant structures--South Side Collection System.



North Platte River Projects, Wyoming--Employees Extinguish Power-plant Fire: Four Bureau employees of the North Platte River Project were treated for smoke inhalation recently as a result of successful efforts to extinguish a fire at the Glendo Powerplant in Wyoming. The fire in the station-service metal-clad switchgear started when an electric arc was established in the main bus section. After the damaged parts had been removed and upon re-energizing a second electric fire developed making it necessary to manually interrupt the source of supply. By using the available self-contained breathing apparatus while fighting the fire, the employees were protected from the injurious effects of toxic fumes and smoke. Further, the utilization of this breathing apparatus enabled the crews to extinguish the fire and restore service sooner. Although emergency d-c lighting was in use in the station-service room following the failure, additional portable lighting would have been extremely helpful to penetrate the dense smoke that accumulated in the room. Also, the effectiveness of the installed emergency lighting was reduced substantially by the heavy accumulation of soot on the light bulbs.

Lower Columbia Development Office, Salem, Oregon: "City Driving," a safety film produced by Ford Motor Company, was shown to the staff on March 2, 1966.

Spokane Valley Project, Spokane, Washington--New First-aid Procedures: C. R. Murphy, Project Safety Officer, took time out from a busy schedule conducting driver improvement and supervisory safety training courses to attend a 2-day course in new first-aid procedures conducted by skilled physicians and surgeons at the University of Washington on March 10 and 11, 1966.

Phoenix Development Office, Phoenix, Arizona: A program on snake-bites, consisting of color slides and narrative was recently presented to the staff by representatives of Wyeth Laboratories.

Region 5 Regional Office, Amarillo, Texas--27th Annual Texas Safety Conference: On March 28-29, 1966, Regional Safety Officer A. V. Ruple attended the Southwestern Regional Federal Safety Council meeting in Dallas, Texas. He also attended the 27th Annual Texas Safety Conference, in which over 3,000 safety specialists from throughout the State participated.

Regional Office, Region 2, Sacramento, California: Mr. Ken Russell from the Bureau of Mines in Oakland presented a demonstration on the "Hazards of Static Electricity" to a group of more than 300 Regional Office employees. This demonstration was presented in the Village Theatre next door to the Regional Office.



South Platte River Projects, Colorado--First-aid Class at Loveland: George B. Fritts, Bureau of Mines, seated at right, front row, was the instructor.

Office of Chief Engineer, Denver, Colorado: Eighteen employees of the Research Division recently completed the 10-hour Bureau of Mines course in first-aid instruction.

Tracy Field Division, Tracy, California--Safety in the Operation of Construction Equipment: On March 18, 1966, 38 employees attended an exceptionally effective lecture on the subject of "Safety in the Operation of Construction Equipment" given by Dale Marr of the Operating Engineers Local Union No. 3, San Francisco.

Regional Office, Region 2, Sacramento, California--Motor Transportation Conference: Regional Safety Officer R. W. Cary attended the mid-winter meeting of the Motor Transportation Conference of the National Safety Council in Toronto, Canada, March 28-31, 1966. At this meeting, he was appointed a permanent member of the Research Committee and the Medical Advisory Committee.

Region 2--California Safety Congress: On March 9 and 10, the Regional Safety Officer along with 16 safety representatives from Region 2 attended the 14th Annual California Safety Congress in San Francisco. Region 2 Regional Director R. J. Pafford, Jr., and Chief Safety Engineer H. S. Latham both participated in this conference.

Regional Office, Region 3, Boulder City, Nevada: Regional Safety Officer Marc Burbidge and all safety officers in Region 3 attended and benefitted from the Regional Safety Conference, held in conjunction with the First Annual "All Arizona" Safety Congress and Exposition in Phoenix, Arizona, on February 24-25, 1966.

* * * * *

Remarks by Howard S. Latham, Chief Safety Engineer
Bureau of Reclamation, Department of the Interior
At the First Annual
"All Arizona" Safety Congress and Exposition
Phoenix, Arizona - February 24, 1966

THE NEED FOR SAFETY IN CONSTRUCTION

It is my pleasure to meet with you and to participate in this first annual "All Arizona" Safety Congress. These conferences present an opportunity for representatives of Industry, Labor, State and Federal agencies, together with others interested in safety, to meet and to discuss problems of mutual interest and concern.

As a result of a recent experience, my assigned subject, "The Need for Safety in Construction," has a significant personal consideration. A nationally known and successful tort claims attorney, in taking my deposition in a third party liability suit, asked me if I was aware that the Construction Industry was a "negligent industry." Since I've been associated with the Industry--in one capacity or another--for the past 20 years, this accusation brought my temper to the boiling point.

How could any rational and thinking individual label the Construction Industry as negligent? An Industry which, more than any other, has contributed to the prosperity of our Nation and the well-being of mankind. The evidence of this progress is clearly visible. All we have to do is look around us: A system of highways, railroads, waterways, telephone lines, television and radio transmitters criss-crossing the Nation, facilitating communication and the movement of materials and persons. Multipurpose irrigation and hydroelectric projects, consisting of dams, canals, and transmission lines, all serving to control the rampages of nature, increase the Nation's agricultural wealth, provide water for thirsty communities, and power and light for industrial and residential use. There are sprawling missile sites essential to our defense. Visible are giant industrial complexes busily converting mineral and fiber into usable products. Rising on the horizon is a complexity of buildings, homes, and service installations, unmatched anywhere in the world. All these are very real contributions, made possible by an Industry staffed by men with vision, ingenuity, and skill.

Can this be a negligent and irresponsible Industry? Obviously, the answer is NO! The choice of words was unfortunate, and the accusation certainly fallacious and unwarranted. However, even in its limited connotation--relating to safety--it is unsettling and prompts some soul-searching by those of us in the Industry.

While I am proud of the Industry and its accomplishments, I am concerned that year after year it experiences one of the highest work injury rates. I am appalled that in 1964 construction accidents claimed 2,600 lives and contributed to 220,000 disabling injuries.

Contractors must be concerned with the inroads made on their profits and resources by reason of the direct cost of workmen's compensation insurance, loss of equipment and material, unscheduled delays, together with the loss of production and efficiency. Disproportionate increases in the cost of compensation insurance, as related to other job costs, has a significant bearing on both profits and bidding. An experience rating credit, reflecting a good safety record, can provide a contractor with a very real bid advantage. Conversely, a poor safety record and a high rate debit can be a serious disadvantage. Also, don't lose sight of the 4 to 1 ratio of indirect to direct accident costs which affect job profit.

Labor must certainly be concerned since it is their members who suffer the pain of injury, together with a loss in earnings. Even under the most liberal compensation acts, compensation insurance is a poor and inadequate substitute for a paycheck. Injury and death also sap the available supply of skilled construction labor, which today is in critical short supply.

The owner is concerned since the cost of a poor safety record is passed on to him in increased building costs and reflected in higher bids. Today the owner, whether Government or private, is also confronted by the possibility of third party liability claims resulting from job connected accidents.

Both the Federal and State Governments are concerned since they have an obligation to provide the men and women of this Nation with a safe and healthful environment in which to live and to earn a livelihood. Where public work is involved they are directly concerned, since they must finance the cost of increased building costs resulting from accidents--reflected in waste, inefficiency, and delay.

Let's face it--we are all involved: Contractors, Labor, the owners, and Government! And, from the record, it is evident that greater emphasis must be placed upon improving the safety record in construction. While the Industry is certainly not negligent, it is evident that many of us have neglected placing adequate emphasis on safety. Further, our efforts--regardless of their sincerity--have often been misdirected or ineffective.

I believe that our immediate objective should be to stimulate new and more vigorous action at all levels toward a more constructive approach to safety in construction. With this in mind, I would like to share with you some of the concepts of effective safety management incorporated in Reclamation's current construction program.

Reclamation's primary aim or objective, with respect to contract administration, is to carry out the building of the Nation's irrigation and hydroelectric projects as expeditiously and as economically as possible in order that the Government will receive a dollar's value for a dollar spent. It is well established that safety promotes both economy and efficiency. Also, in order to maintain the public's confidence in our activities, we have an obligation to provide for the safety of the men and women who work on these projects. Actually, these objectives are no different than the desires of any other responsible Government agency, contractor, or owner.

Primarily, we desire contractors who believe and indicate by their actions that safety is an integral part of the work--are convinced that safety is sound economy--and, as a result, take the initiative in formulating and conducting an aggressive safety program.

There are definite criteria, established by the Industry, which we consider essential to an effective contractor safety effort. They are:

1. Safety Program. A bona fide safety program embodying company policy and incorporating safety requirements pertaining to all work engaged in by the firm. However, no safety program is worth the paper it is printed on unless top management gives it full backing and line supervisors are made to understand the importance of getting workers to comply with the safety requirements. I strongly recommend the use of the American Standards Association A.10 Code and the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, as guides in formulating an effective safety program.

2. Competent Safety Supervision at the Job Level. Provision should be made for responsible and competent safety supervision--either a career safety engineer or designation of a key supervisor--depending upon the size and nature of the job.

3. First-Aid and Medical Facilities. Provision for adequate facilities and trained personnel to provide prompt and efficient first-aid and medical attention for injured employees. Every foreman should be required to possess either a U.S. Bureau of Mines or American Red Cross first-aid certificate.

4. Safety Education and Training Program. Such training, as a minimum, should provide for monthly supervisory safety meetings and weekly tool-box safety meetings conducted by the foremen and attended by every workman on the job.

Probably the most pressing need is for an effective safety training program for construction supervisors--foremen and superintendents. The Associated General Contractors of America have attempted

to meet this need through the development of a "Safety Training Course for Construction Supervisors." This training fills a need of long standing in the Construction Industry. Reclamation is sold on the course to the extent that we require every construction inspector to complete this 30-hour course of instruction in construction safety. In providing this training in the field, we have solicited both the assistance and participation of knowledgeable Labor and Contractor representatives--with success. As a result, this training has become a joint Contractor, Labor, and Government venture, beneficial to all. Regardless of whether or not a contractor is a member of the AGC, it appears in his interest, and certainly in the interest of the Industry, that he participate in this training program.

Labor can and should participate more fully in this important aspect of safety. Safety can be given greater emphasis in the apprenticeship training program. Further, the building crafts can follow the example of Local No. 3 of the Operating Engineers in promoting safety education. Dale Marr, who conducts this training at craft safety meetings, puts on one of the most informative and impressive safety talks, illustrated by slides, that I've had the pleasure to hear. Further, attendance at these safety meetings is consistently greater than the attendance at the craft business meetings. I only wish more unions would show the same constructive interest in providing safety education for their members; and, obviously, I wish there were a lot more "Dale Marrs."

5. Industrywide Acceptance and Compliance with Health and Safety Standards. Safety standards relating to construction activity are encountered in various forms. There are State safety orders constituting a legal obligation on the part of the contractor for compliance--and, incidentally, this obligation applies to contractors doing work for Reclamation. Several Government agencies, including Reclamation, incorporate safety standards in their contract specifications: These represent a contractual obligation on the part of the contractor for compliance. Also, there are numerous sources of recommended safety standards pertaining to construction. To name a few of these sources: The American Standards Association--who are presently revising and enlarging the A10 Code covering construction--the Associated General Contractors of America, the National Safety Council, together with compensation insurance companies.

I would like to briefly discuss the value of construction safety standards by reviewing the results of an analysis of fatal accidents suffered by Reclamation contractors during the past 3 years. During this period, 27 contractor employees lost their lives in 24 accidents. Our analysis showed that:

Failure to observe Bureau safety standards was evident in 22 of the 24 fatal accidents.

Failure to observe two or more Bureau safety standards was evident in 13 of the 24 fatal accidents.

Based upon the study, we can only assume that knowledge of, and compliance with the safety standards would have conceivably prevented 92 percent of the fatal accidents which took place during the past 3 years. More significant is the fact that such compliance would have prevented the tragic loss of 25 lives. I don't know about you, but I can assure you that Reclamation is convinced of both the value and the need for construction safety standards. Further, since by far the majority of the fatal accidents resulted from failure of the employee to observe or follow safe practices, the need for increased safety education and training is apparent.

Referring to this fatality study, I'd like to point out: Reclamation safety standards and requirements are based upon, and are similar to the standards generally accepted by the Industry. In fact, they were reviewed by the Associated General Contractors of America prior to publication. Also pertinent is the fact that during this 3-year period, Bureau contractors had an average accident frequency rate of 14.2 accidents per million man-hours worked, which is considerably below the average accident rate for heavy construction in the Nation.

6. Formulation of Safety Standards for the Construction Industry. I'd like to make one more comment about safety standards for the Construction Industry. I've heard numerous contractors gripe or complain about State and Federal agency safety standards--They are too stringent, impractical, not applicable, and so forth. I've been guilty of this myself, and there is probably considerable truth in the complaints.

However, there is a solution to this--too seldom exercised by contractors. Contractors should take the time and expend the effort to participate in the formulation of these standards. Participation is available through contractor associations, the Construction Section of the National Safety Council, the American Standards Association, and at review hearings called by the various State Industrial Commissions. While such participation requires time and effort, it is essential if construction safety standards are to reflect the needs and desires of the Industry. --There's an old saying: "If you can't beat them, join them." I'd suggest you join.

I'd like to leave one last thought for your consideration--LET'S START BY PREVENTING THE ACCIDENTS THAT KILL.

The same accident review disclosed that 20 of the 24 fatal accidents--83 percent--resulted from the operation of construction equipment.

Rubber-tired equipment, scrapers, bottom-dump, and end-dump trucks were involved in 10 of these fatal accidents. Mobile cranes accounted for 7 more.

Control equipment accidents, particularly truck and crane accidents, and you will be well on the way toward achieving a safety record you can live with--and afford. How?

Design. Increased consideration for the health and safety of the operator and others should be provided in the design of heavy equipment. For example, the failure of the air-braking systems contributed to 4 of the 10 fatalities which involved rubber-tired hauling equipment. Unfortunately, as you know, similar failures occur frequently throughout the Industry. Dual or emergency braking systems would have prevented many of these accidents.

The new safety orders published by the State of California, effective August 7, 1965, provide for the installation of an emergency braking system on all haulage and earthmoving vehicles equipped with air brakes. Reclamation is considering similar action. Further, there is much to be desired in the design of vehicle lighting systems, overhead protection on dozers, boom stops and boom angle indicators on cranes, provision for all-round operator visibility on haulage vehicles, and the elimination of pinch points on excavation equipment. You, no doubt, can readily think of additional items.

In keeping with our objective of new and progressive thinking, we can't afford to overlook the problem of environmental health. I'm speaking of designing for the elimination or reduction of excessive noise, harmful dusts, and extreme temperatures. I'm personally convinced that air-conditioned cabs on heavy equipment operated in hot climates is not too far in the future. Noise abatement, achieved by relocating exhaust ports or by the installation of sound barriers or absorption material, should be undertaken now. These improvements are necessary and are comparatively inexpensive when compared with the overall cost of equipment. Further, dollars expended in this manner will be returned ten fold in increased production and reduced accident costs.

Maintenance. Preventative maintenance, with provision for tagging and deadlining faulty equipment, is essential to an effective safety effort. -- This is all too often neglected under the dangerous and uneconomical pretense of delaying production.

Operator Qualification and Training: This need is probably the most important and usually the most neglected factor in safe equipment operation. To be effective, both management and labor must participate in this program, involving provision for training new operators, checking

out operators when they are hired, insuring that operators are physically qualified, together with provision for on-the-job safety training and education.

I doubt that any of us here entertain any doubt as to "The Need for Safety in Construction." Casual reflection will disclose how significant accident experience is in relation to the Construction Industry: Its effect upon our ability to achieve a quality product--on time--with optimum safety and at a profit.

I've presented six basic safety concepts absolutely necessary to achievement of a good safety record--all requiring initiative and the expenditure of time and effort on the part of those in the Industry--And all capable of achievement by any reasonably competent management. Those of us in the Construction Industry can reaffirm our SKILL, RESPONSIBILITY, AND INTEGRITY by pinpointing these concepts or objectives for accomplishment--NOW!

We can start by preventing the ACCIDENTS THAT KILL.

* * * * *

"AIRFLAM"

Appearing on the market recently is a new type of cigarette lighter which the U.S. Public Health Service and many local governments have condemned as highly dangerous. Little wonder! The lighter burns with an almost invisible flame, and it lights automatically merely by removing the cap! The dangers inherent in such a product are obvious (the cap coming off accidentally in one's pocket; the lighter being handled by a child). Spread the warning word about the "Airflam." It's fueled by methyl alcohol and is available through mail order outlets.

WHY EYE PROTECTION?

Safety Quiz: Does a steel chip flying from the face of a hammer usually go--(a) Toward the man using the hammer; (b) Directly away from the man; or (c) Off to either side? The flying chip usually goes toward the center of the arc--in other words, toward the user. That's another reason for wearing eye protection.

---"Safety Engineering," April 1966

* * * * *

WATER SAFETY

NATIONAL SAFE BOATING WEEK - JULY 3-9, 1966

Proclamation 3698

NATIONAL SAFE BOATING WEEK, 1966

By the President of the United States of America

A Proclamation

The family boating trip has now become almost as common in American life as the family picnic. It is a profound testimony to the strength of our American system and the scope of our prosperity that the recreation of boating, once the pastime of a privileged few, is now enjoyed by millions of families from all walks of life.

With the steadily increasing traffic on our waterways, however, it is vital that no efforts be spared to keep boating safe as well as stimulating. The knowledge and practice of safe boating principles can make hours spent upon the water measurably safer and more pleasurable.

Since 1958, when the Congress first requested the President to annually proclaim National Safe Boating Week, the rise in boating accidents has been largely checked. This record can be maintained—and improved—only if the nation's boating organizations, Federal and State agencies, and the boating industry continue their efforts to inform the public of the importance of safe boating practices.

NOW, THEREFORE, I, LYNDON B. JOHNSON, PRESIDENT OF THE UNITED STATES OF AMERICA, do hereby designate the week beginning July 3, 1966 as National Safe Boating Week.

I urge every American who uses our waterways to re-examine his boating habits during this Week and decide what he can do, individually and together with his countrymen, to reduce accidents and prevent the needless waste of lives on the water.

I also invite the Governors of the States, the Commonwealth of Puerto Rico, and other areas subject to the jurisdiction of the United States of America to join in this observance and ask them to exert their influence in the cause of safe boating during this Week and throughout the entire year.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Seal of the United States of America to be affixed.

DONE at the City of Washington this 19th day of January in the year of our Lord nineteen hundred and sixty-six, and of [SEAL] the Independence of the United States of America the one hundred and ninetieth.

LYNDON B. JOHNSON

By the President:

GEORGE W. BALL,
Acting Secretary of State.

[F.R. Doc. 66-893; Filed, Jan. 21, 1966; 4:15 p.m.]

FEDERAL REGISTER, VOL. 31, NO. 16—TUESDAY, JANUARY 25, 1966

Weber Basin Project, Ogden, Utah--Boat Show and Water Safety Carnival: The Bonneville Water Safety Council is making plans for the annual Boat Show and Water Safety Carnival to be held May 28 and 29, 1966, at Pineview Reservoir in the mountains just 7 miles from Ogden.

Logan Development Office, Logan, Utah: The Cache County Water Safety Council held a meeting on March 28, 1966, to discuss plans for the continuation of summer water safety activities initiated by the Council. It is expected that from 3,000 to 4,000 children will receive instruction under the summer swimming program conducted annually by area schools. The Council will propose that other water safety instruction be included in these classes and will aid in obtaining films, posters, literature, etc.

Region 3, Boulder City, Nevada--Award of National Safety Council President's Medal to Mr. E. H. Pratt: At a meeting of the Mohave County (Arizona) Water Safety Council, Captain Vernon Munsell, President of the Colorado River Water Safety Council, presented the President's Medal to Mr. E. H. (Ham) Pratt, Vice Chairman of the Mohave County Water Safety Council, for saving the life of Mrs. Lillian Koeppen by mouth-to-mouth resuscitation methods. In accepting the award, Mr. Pratt stated, "This is a tribute to the training I have received through the Water Safety Council * * *."



PX-D-53385

Captain Vernon Munsell (left) presents NSC President's Medal to Mr. E. H. (Ham) Pratt for saving a life by mouth-to-mouth resuscitation.

VEHICLE SAFETY

WHEEL FAILURES--1/2-TON PICKUP TRUCKS OPERATED BY INTERIOR

A Department of the Interior survey disclosed that there was a total of 147 wheel failures on 1/2-ton pickups experienced by the various Interior agencies during 1965. Fortunately, only 2 accidents are known to have resulted from these failures. Of the failures, 96 occurred on a popular make of a 1965 model 1/2-ton pickup, 26 occurred on 1964 models of 1/2-ton pickups manufactured by the same company, and the remaining 25 occurred on pickups of other makes and models.

The failures ordinarily occurred either where the wheel rim is welded to the wheel or at the center of the rim. The following photographs show typical failures on 1/2-ton pickups and carryalls.



Reclamation findings indicated that these wheel failures could usually be attributed to three factors; namely, overloaded vehicles, excessive side strain on curves or rough terrain, or lightweight wheels and rims. These conditions do not discount the obvious fact that the wheels were designed with an inadequate factor of safety.

The following procedures are recommended to reduce the evidence of wheel failures:

1. Specify heavy-duty rims where the nature of the operations warrant.
2. Select the proper vehicle for the job. Post warnings on all pickups and carryalls, including maximum load and warning against overload.
3. Operate all vehicles safely, adjusting speed to the terrain and road conditions.
4. Provide for periodic and intensive wheel inspections by qualified mechanics.
5. Replace all defective wheels immediately and notify the property officer of the General Services Administration of the failure, submitting full particulars relating to the failure.

SLOW-MOVING VEHICLE (SMV) EMBLEMS

Yuma Projects Office, Yuma, Arizona, recently purchased slow-moving vehicle emblems for installation on vehicles designed to travel on public roads at speeds of less than 25 miles per hour. The SMV emblem pictured below is mounted on No. 16-gage galvanized steel of triangular shape measuring 16 by 14 inches. It was purchased from AG-Tronic, Inc., 510 West South Street, Hastings, Nebraska, at a cost of \$2.98 each, without mounting brackets. The center utilizes high-visibility orange Scotchcal outlined by red reflective Scotchlite. The emblem is not a clearance marker for wide machinery, nor is it to replace lighting and/or other marking devices required by state law.



TAILGATING

About 25 percent of all traffic accidents are rear-end collisions. Most of these crashes are caused by "tailgating"--following too closely and inattention by the driver.

Injuries in rear-end collisions occur in three basic ways: (1) when car occupants are smashed against the inside of the car; (2) when doors spring open and occupants are thrown out; (3) whiplash injuries that occur when driver's or passengers' heads are snapped back.

Approximately 65 percent of rear-end crashes occur on dry, level pavement; 71 percent took place in clear weather, and 72 percent during daylight hours. The point of these statistics should be clear: rear-end crashes occur most often under relatively good driving conditions, when drivers are not as careful as they should be.

NEW FACTS ABOUT SKIDDING

In heavy rain and slush, your front wheels leave the road and climb onto a tough film of rain and you hydroplane (tires "climb" up on the surface of the water). Speed adds to the danger of this--and you do lose control--so drive slowly in rain.

Put more air in your tires in heavy rain--a lot more--don't drive in heavy rain with old tires.

Drive in the "tire wipes" left by cars or trucks ahead as a protection and DON'T TAILGATE!

If you do skid, DON'T accelerate and don't brake--steer into the skid.

Watch for reverse skid that often follows.

Use so-called "jab braking"--make and brake quickly--not sluggish pumping usually used.

Slush is most dangerous--front end may refuse to steer and you go into a "plow skid." NEVER try to pass in slush.

Never apply brakes in a puddle, hydroplaning is at its worst--avoid puddles on curves especially.

Remember you can skid on a dry road--it can be very slippery.

On rainy days your car's a boat. In England there are skid schools to teach the exact rhythm of handling a skid, but none yet in the USA.

---NSC Fleet Safety Newsletter

AN IMPROVED DRIVER

The following is an excerpt from a memorandum from an employee to his supervisor concerning the Bureau-wide Driver Improvement Training Course:

"On January 31, 1966, I was notified that a safety meeting had been scheduled for February 1 and 2, and it was mandatory that I attend.

"In view of the fact that I had been given the privilege to operate a motor vehicle back in 1935, I was under the impression that I knew all or practically all the rules when sitting behind the wheel of an automobile.

"I entered the meeting with a 'know it all' attitude and with a premature idea that such a gathering would be a waste of time and money.

"The manner in which the program was presented by the instructors left no doubt that these two individuals have taken their duties seriously, consequently selling the public on safety.

"I left at the conclusion of the meeting in an entirely different frame of mind. I am very happy that I was there and I consider it a privilege to have been told to attend.

"I also heard several individuals comment that it was a worthwhile endeavor which would result in better driving, better performance, and perhaps the saving of a life."

SEAT BELTS--TORNADO TESTED

During a tornado, four men were riding in an auto that was picked up and hurled more than 250 yards. Three of the men were thrown from the auto. Two of these were killed and the third was seriously injured. The driver of the car, who wore a seat belt, was not seriously injured.

CASE FOR AIR CONDITIONING

Some motorists are finding that air conditioning is a safety feature as well as a comfort in hot weather. They point out that it reduces fatigue, screens out pollen and dust that can cause dangerous discomfort, and makes it possible to keep windows closed, thereby reducing the noise level.

* * * * *

PROGRESS REPORT--BUREAU SAFETY TRAINING

Following are the total number of employees who have completed Bureau training commitments since inception of these training programs in 1965:

	<u>Driver Improvement Training</u>	<u>Safety Training Course for Construction Supervisors and Inspectors 30-hour Course</u>	<u>One or More Sessions</u>
Region 1	799	73	19
Region 2	1,055	102	210
Region 3	43	3	21
Region 4	940	109	75
Region 5	616	59	39
Region 6	511	41	43
Region 7	<u>711</u>	<u>190</u>	<u>--</u>
Totals	<u>4,675</u>	<u>577</u>	<u>407</u>

Shown below are employees of the Middle Rio Grande Project and the Albuquerque Development Office participating in the Driver Improvement Training.



Navajo Indian Irrigation Project, Farmington, New Mexico: View showing Driver Improvement Class in session as Safety Officer D. E. Golightly demonstrates elements of defensive driving.



Southern California Development Office, San Bernardino, California: Shown above are employees who have completed Driver Improvement Course. Seated, left to right: J. Roberts, R. Lopez, J. Woods, R. Kalber, D. Macura, W. Samuel, E. Rounds. Standing left to right: D. Mach, L. Shaffer, D. Padget, A. Peck, R. White, R. Pavlovich, J. Winston, Instructor (who has recently transferred from the Region 3 Regional Office, Boulder City, Nevada, to the San Juan-Chama Project, Colorado-New Mexico, where he is the Project Safety Officer).

Columbia Basin Project, Washington--Forty-three Irrigation and Land Division employees attend safety training:



Robert Budner, DuPont Explosive Representative, is shown presenting the subject, "Handling and Use of Explosives." The instruction followed the lesson guide developed and published by the Associated General Contractors of America, entitled "Safety Training Course for Construction Supervisors," available from the Associated General Contractors of America, 1957 E Street, NW., Washington, D.C. 20006.

Spokane Valley Project, Washington: Twenty-three employees of the Spokane Valley Project have completed the 30-hour safety training course for construction supervisors and inspectors. Safety Officer C. R. Murphy is shown below (seated) instructing one group, left to right: James Fox, Wm. Dorn, Charles Link, R. Murphy, Dale Magee and Robert Neal.



Canadian River Project, Texas: Employees successfully completing 30-hours of safety training at Plainview, Texas, are shown below after receiving appropriate certificates and wallet-size cards. Left to right: Project Safety Officer C. R. Woodrome, the instructor; Leland Thrailkill, Leverne Lincoln, John Gossman, Donald Barron, Harry Swift, Jr., Leon Hatcher, Andrew Waselus, Elton L. Holland and Roy V. Templin.



SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

1st QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH March 31, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Washington Office	287	144,648					
Denver Office	1,491	745,744					
Alaska District	43	21,056					
REGION 1							
Boise Regional Office	185	82,745					
Baker Project	22	10,317					
Central Snake Projects Office	46	12,777	1		1	50.6	51
Chief Joseph Dam	29	12,978					
Columbia Basin Project	851	432,240	6		130	13.9	301
Hungry Horse Project	52	26,851					
Lower Columbia Development Office	46	19,939					
Mann Creek Project	16	6,477					
Minidoka Project	66	50,041					
Rogue Project	8	3,752					
Snake River Development Office	48	23,993					
Spokane Valley Project	37	18,172					
The Dalles Project	13	5,738					
Upper Columbia Development Office	47	20,768					
Yakima Project	31	13,708					
Totals & Averages	1,497	747,506	7		131	9.4	175
REGION 2							
Sacramento Regional Office	615	329,406					
Auburn Field Office	22	4,048					
Cachuma Operations Field Branch	2	1,040					
Central Coast Dev. Field Branch	6	3,120					
Folsom Field Division	71	35,990					
Fresno Field Division	149	74,104					
Fresno CVP Construction Office	109	52,579					
Klamath Project Office	25	12,873					
Lahontan Basin Projects Office	35	17,040					
Napa Development Field Branch	9	4,344					
Red Bluff CVP Construction Office	98	49,904					
Reno Transmission Lines Office	31	15,570					
San Luis Unit CVP Construction Office	561	316,711	1		25	3.2	79
Shasta Field Division	128	64,480					
Solano Operations Field Branch	2	1,040					
Tracy Field Division	171	87,512					
Upper North Coast Field Branch	4	2,080					
Willows CVP Construction Office	119	58,496					
Totals & Averages	2,157	1,130,937	1		25	0.9	22
REGION 3							
Boulder City Regional Office	172	81,600					
Boulder City Development Office	20	8,864					
Boulder Canyon Project Office	146	75,154					
Dixie Project Office	43	23,184					
Lower Colorado River Control:							
Cibola Field Division	86	40,764					
Laguna Field Division	18	8,147					
Needles Field Division	50	20,802					
Pala Verde Field Division	19	9,099					
Parker-Davis Project Office	302	153,105					
Phoenix Development Office	124	59,520					
Southern California Dev. Office	40	20,340					
Yuma Projects Office	203	113,520					
Totals & Averages	1,230	614,099					
REGION 4							
Salt Lake City Regional Office	272	129,576					
Central Utah Projects	153	73,051					
CRSP Power Operations Office	199	106,963	1		6,000	9.3	56,094
Curecanti Unit	169	92,031					
Durango Projects	40	17,477					
Emery County Project	33	18,020					
Glen Canyon Unit	178	92,632					
Grand Junction Projects	108	53,376					
Logan Development Office	13	6,108					
Lyman Project	11	4,712					
Seedskadee Project	28	14,416					
Upper Green River	8	4,160					
Weber Basin Project	114	62,692					
Totals & Averages	1,326	674,614	1		6,000	1.5	8,894
REGION 5							
Amarillo Regional Office	120	57,129					
Albuquerque Development Office	42	19,691					
Arbuckle Project	47	26,553					
Austin Development Office	49	22,270					
Canadian River Project	145	72,273					
Lower Rio Grande Project	4	2,048					
Middle Rio Grande Project	217	103,970	1		11	9.6	106
Navajo Project	74	38,329	2		30	52.2	783
Oklahoma City Development Office	21	9,775					
Rio Grande Project	222	103,034					
San Juan-Chama Project	64	33,837					
Totals & Averages	1,005	488,915	3		41	6.1	84
(Continued)							
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

1st QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH March 31, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	191	93,195					
Canyon Ferry Project	15	7,292					
Fort Peck Project	37	16,273					
Missouri-Oahe Projects	194	98,560	1		5	10.1	51
Missouri-Souris Projects	108	49,948	2		39	40.0	781
Power System Operations Office	43	20,480					
Riverton Projects	12	5,680					
Upper Missouri Projects	106	49,829					
Yellowtail Project	111	47,884					
Totals & Averages	817	389,141	3		44	7.7	113
REGION 7							
Denver Regional Office	228	110,128					
Fryingpan-Arkansas Project	232	107,040	2		36	18.6	336
Kansas River Projects	256	125,868					
Niobrara-Lower Platte Projects	127	66,752	1		5	15.0	75
North Platte River Projects	271	154,320					
South Platte River Projects	162	81,952					
Totals & Averages	1,276	648,060	3		41	4.6	63

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT CONTRACTOR FORCES

1st QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH March 31, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		OAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL #			
DENVER OFFICE	211	77,218					
REGION 1							
Baker Project	42	13,205	1		20	75.7	1,515
Chief Joseph Dam	39	19,036	1		30	52.5	1,576
Columbia Basin Project	234	81,150	2		6	24.6	74
Maan Creek Project	62	14,063					
Rogue Project	14	4,075					
Spokane Valley Project	120	29,532					
The Dalles	13	1,980					
Yakima Project	12	4,869					
Totals & Averages	536	167,910	4		56	23.8	334
REGION 2							
Presno CVP Construction Office	50	7,353					
Red Bluff CVP Construction Office	152	70,368					
Presno Field Division	8	1,692					
Reao Transmission Lines Office	15	11,800					
San Luis Unit CVP Construction Office	1,964	830,590	3		39	3.6	47
Shasta Field Division	11	4,895					
Tracy Field Division	6	351					
Willows CVP Construction Office	221	56,494					
Totals & Averages	2,427	983,543	3		39	3.1	40
REGION 3							
Lower Colorado River Control:							
Cibola Field Division	4	1,625					
Needles Field Division	8	4,258					
Palo Verde Field Division	95	33,250					
Parker-Davis Project	136	66,640	2		67	30.0	1,005
Yuma Projects	11	12,024					
Totals & Averages	254	117,797	2		67	17.0	569
REGION 4							
Central Utah Projects	10	5,203					
Curtis Unit	517	251,927	1		160	4.0	635
Durango Projects	26	7,995	1		1	125.0	125
Emery County Project	15	9,466					
Glen Canyon Unit	319	169,305	2		95	11.8	561
Grand Junction	115	39,333	1		2	25.4	51
Loman Project	9	2,684	1		300	372.6	111,774
Sandskaden Project	28	12,411	1		9	80.6	725
Weber Basin Project	26	19,078	2		255	104.8	13,366
Totals & Averages	1,065	517,443	9		822	17.4	1,589
REGION 5							
Amarillo Regional Office	8	5,167					
Arhuckle Project	303	101,447					
Austin Development Office	2	96					
Canadian River Project	702	300,453	2		16	6.7	53
Navajo Indian Irrigation Project	265	128,514	7	1	6,133	54.3	47,611
Rio Grande Project		360					
San Juan-Chama Project	271	167,553	6	1	6,118	35.8	36,513
Totals & Averages	1,551	703,900	15	2	12,267	21.3	17,427
REGION 6							
Fort Peck Project		100					
Missouri-Oahe Projects	14	3,491					
Missouri-Souris Projects	3	1,003					
Riverton Projects	11	4,120					
Upper Missouri Projects	27	5,124					
Yellowtail Project	259	133,985	1		8	7.5	60
Totals & Averages	314	147,823	1		8	6.8	54
REGION 7							
Denver Regional Office	29	14,604					
Pyralispan-Arkansas Project	310	146,033					
Kansas River Projects	262	109,480					
Nebraska-Lower Platte Projects	53	15,270					
North Platte River Projects	47	16,193					
Totals & Averages	701	294,560					
CONSOLIDATED TOTALS	7,059	3,010,194	34	2	13,259	11.3	4,405
TOTALS LAST YEAR (1965)	7,181	15,624,209	223	8	58,084	14.3	3,718

*FATALITIES INCLUDED IN TOTAL DISABLING

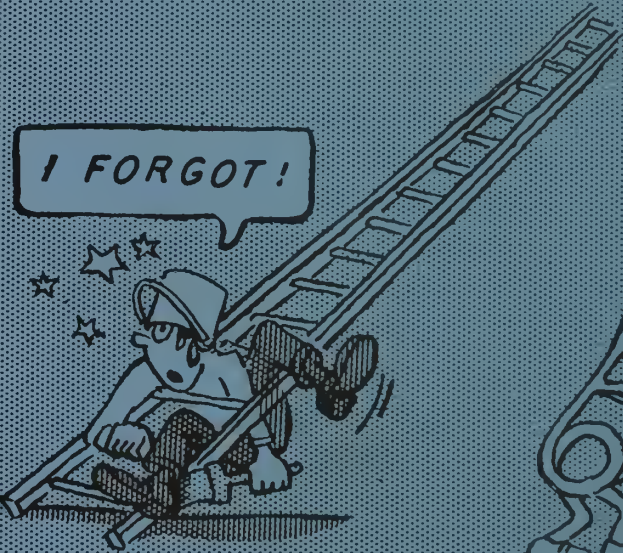
FT/11/16

WAIT
FOR
WALK
LIGHT

I FORGOT!



I FORGOT!



I FORGOT!



US
MISSION
SAFETY
70

I FORGOT!



PUNNINGHAM 66
P.U.S.B.R. Region 7

I FORGOT

Of all the lame excuses,
The poorest of the lot
Is sheer contempt for safety--
That well-worn "I Forgot!"

That lad whose ladder tumbled
Lies bandaged on a cot.
He knows he should have tied it,
But mumbles: "I Forgot!"

The one who cleaned his rifle
Was startled by a shot;
The loss of two good fingers
Was caused by "I Forgot."

The gent who wore no goggles
Around the acid pot,
And one who wore no gas mask
Both use the "I Forgot."

In every cemetery
You'll likely find a plot
With headstone prayer: "Rest in Peace."
It should read: "I Forgot."

Mistakes may often be excused;
Forgetfulness cannot.
If absent-minded we must be--
Forget the "I Forgot!"

George McMurdo



MISSION
SAFETY

70

RECLAMATION SAFETY NEWS



SECOND QUARTER 1966



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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TABLES

Safety Performance Record

Government--First 6 months--1966	36-37
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Front Cover Photo: Secretary of the Interior Stewart L. Udall (right) presented two top safety awards--third year in a row--to Commissioner Floyd E. Dominy. "I am happy to congratulate the Bureau of Reclamation for again earning these awards and for its outstanding and continuing safety effort," said Secretary Udall. He presented to the Bureau the 1965 plaques for both the National Safety Council's highest award: the Award of Honor, and the Department's highest: the Interior Safety Award. PX-D-54819 NA

BUREAU SAFETY PERFORMANCE

1966 CUMULATIVE SAFETY RECORD January 1 - June 30, 1966

A. GOVERNMENT FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Alaska District	0.0	0.0	0	0.0
Region 3	0.0	0.0	0	1.6
Region 2	0.04	0.4	11	3.6
Region 5	1.9	2.9	67	4.2
Region 7	2.9	3.8	75	1.8
Region 1	18.8	8.0	235	3.6
Region 4	66.4	1.5	4,427	2.3
Region 6	<u>557.6</u>	<u>7.4</u>	<u>7,535</u>	<u>3.0</u>
Totals to date	28.8	2.6	1,107	3.0
Totals 1965	7.4	2.8	264	2.9
Job Corps Conservation Centers		4.5	29	27.0

B. CONTRACTOR FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	2.9	6.2	46	0
Region 1	52.8	19.2	275	0
Region 4	94.0	11.8	797	0
Region 3	99.0	18.3	541	0
Region 2	643.4	8.8	7,311	2
Region 5	1,532.7	17.2	8,911	2
Region 7	<u>3,327.8</u>	<u>17.4</u>	<u>18,608</u>	<u>2</u>
Totals to date	874.9	12.7	6,889	6
Totals 1965	531.7	14.3	3,718	8

*Injury index is equal to frequency rate times severity rate divided by 100.

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1966
Second Quarter

Cumulative to Date:
June 30, 1966

A. ACCIDENT CLASSIFICATION:

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Vehicles	5	108
Electricity	1	6,000
Handling materials and equipment	8	134
Falling objects	2	21
Falls of persons	6	135
Flying particles	2	64
Handtools	1	8
Machinery	4	6,168
Other (tick bite)	1	4
	<u>30</u>	<u>12,642</u>

B. OPERATIONAL SUMMARY:

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	4,476,313	5	88	1.1	20
Construction	2,600,446	5	6,084	1.9	2,340
Investigation	1,245,202	5	86	4.0	69
Power O&M	1,710,888	10	6,221	5.8	3,636
Irrigation O&M	<u>1,390,542</u>	<u>5</u>	<u>163</u>	<u>3.6</u>	<u>117</u>
Totals	11,423,391	30	12,642	2.6	1,107

C. SERIOUS ACCIDENTS:

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
1-11-66	Foreman III Lineman	Electric power burns	6,000 (Nonfatal)
6-16-66	O&M Superintendent	Crushed by mobile crane	6,000 (Fatal)

MISSION SAFETY-70

THE WHITE HOUSE

STATEMENT BY THE PRESIDENT

I am pleased to learn from Secretary of Labor Wirtz that more than 50 departments and agencies have inaugurated programs in the past year to meet the objective of Mission SAFETY-70. That objective is to reduce Federal employee injuries and costs 30 percent by 1970.

I have never believed that the Government can afford the attitude that "Accidents will happen." Our philosophy must be, "Accidents should not happen."

We have now begun to put that philosophy into effect. Secretary Wirtz' report shows:

- A 4.3 percent decline in the overall Federal injury frequency rate.
- A reduction from 2 to 26 percent in the injury rates among the 14 largest agencies, employing over three-fourths of the two and one-half million Federal workers.
- One thousand fewer disabling injuries to Federal employees during the first year of the program.

We are pleased with these results. But we must press on to meet our long-range goals. Accidents still cost the Government about \$200 million each year plus untold human suffering. Agency heads must now translate their declarations of intent--and their written programs--into tangible results.

The major cause of death in the Federal service is motor vehicle accidents. Government vehicles cover nearly 2-3/4 billion miles annually. We must look more carefully at both the drivers and the vehicles they operate. Our drivers must be carefully selected, thoroughly tested, and properly trained. Our vehicles must comply with the highest safety standards and must be maintained in top condition.

But auto and other accidents away from work cause just as much suffering and just as much production loss as those accidents which occur on-the-job. Off-the-job safety programs are becoming increasingly important, and I expect administrators to encourage their employees to live safely as well as work safely.

Finally, I expect to see the establishment and improvement of internal operating procedures to provide uniform accident data for Government-wide summary and analysis.

The Federal Government has rightly taken the lead in national accident-prevention programs--particularly those which occur on our highways. We intend to do everything we can to help the states reduce this wholesale slaughter of American citizens.

In the process, however, we must be certain that our own house is in order. That is the meaning--and the challenge--of Mission SAFETY-70.

* * * * *

RECLAMATION FACTS

Reclamation is Basically Self-supporting: Approximately 90 percent of the costs of the projects built by the Bureau of Reclamation are repaid to the Federal Government by the users with interest, except for those costs allocated to irrigation, which are repaid in full without interest.

Reclamation's Record to Date

Total Investment	\$4.9 billion
Irrigation service area	
110 projects	9.0 million acres
Hydroelectric plant capacity	
48 powerplants.....	6.2 million kilowatts
Municipal and industrial water to	
serve a population of 10 million	517 billion gallons annually
Recreation	
210 recreation areas.....	34.3 million visitor days

Investment Return

Construction costs repaid to date	\$749 million
Electric power income	\$1.2 billion
Crop value	\$21.7 billion

* * * * *

SAFETY AWARDS

DEPARTMENT OF THE INTERIOR CERTIFICATE OF SAFETY
ACHIEVEMENT AWARD PRESENTED TO EMPLOYEES OF
YUMA PROJECTS OFFICE, YUMA, ARIZONA



The Department of the Interior Certificate of Safety Achievement Award is presented to Project Manager T. H. Moser, Yuma, Arizona, by Region 3's Regional Director A. B. West (shown holding the Certificate) in recognition of 500,000 man-hours worked by Yuma Projects employees without experiencing a disabling injury. As of June 30, 1966, this figure increased to 850,000 man-hours, and covers the period commencing September 8, 1964. Project Safety Committee members proudly witnessing the presentation are, left to right: K. D. Bonbrake, Chief, Planning Division; W. E. Barcus, Jr., Project Safety Officer; Mr. West; Mr. Moser; W. D. Sears, Chief, Imperial Dam Division; A. H. Wadin, Chief, Operations Division. Committee members absent from the above picture are E. H. Jefferies, Construction Engineer, and F. Keller, Jr., Chief, Field Engineering Division.

NATIONAL SAFETY COUNCIL PRESIDENT'S MEDAL
AWARDED TO MR. CLYDE H. GLEASON

Fryingpan-Arkansas Project--Construction Field Division--Salida,
Colorado:



Mr. Clyde H. Gleason, center, is shown holding the certificate that accompanied the NSC President's Medal awarded to him for saving a life through the application of mouth-to-mouth resuscitation. On the left is Project Safety Engineer Dennis Fankhauser, and on the right is Emrys F. Samuelson, Mr. Gleason's supervisor. The value of the first-aid instruction conducted by the Bureau of Reclamation is reflected in Mr. Gleason's timely and effective life-saving effort.

DEPARTMENT SAFETY COUNCIL AWARD OF MERIT
PRESENTED TO MR. RALPH C. MEAGER

The Department Safety Council Award of Merit has been presented to Mr. Ralph C. Meager, Projects Safety Officer, Kansas River Projects, McCook, Nebraska, who retired December 31, 1965. In transmitting the Award of Merit, Mr. Newell B. Terry, Director of Personnel, Department of the Interior, stated in part, as follows:

"The record shows that during the eighteen years that Mr. Meager has served as the Kansas River Projects Safety Officer prior to his retirement, his office

achieved an outstanding safety record as evidenced by the presentation of 20 Department of the Interior Certificates of Safety Achievement since 1956. Mr. Meager promoted water safety by organizing Water Safety Councils at McCook, Nebraska, and Norton, Kansas, as part of Operation West-wide, which is sponsored jointly by Reclamation and the American Red Cross. His devotion to the cause of safety, both on and off the job, has been highly beneficial to both the Government and the public."

CONSTRUCTION SAFETY AWARDS

The Bureau of Reclamation's Construction Safety Award was presented to Mr. George Gibson, Superintendent for Weaver Construction Company, on July 11, 1966, for that Company's exemplary safety record during construction of boat ramps on the Yellowtail Unit in Montana. The contract was completed without a single disabling injury.

Shown below, left to right: L. M. Hayes, Region 6's Regional Safety Officer; J. R. Granger, Project Construction Engineer, Hardin, Montana; Mr. Gibson; S. E. Moss, Jr., and W. E. Markus, all of whom participated in the award ceremony.





Mr. Roy F. Johnson, President of the Sandkay Construction Company, Inc., left, is presented with Reclamation's Construction Safety Award by Region 1's Assistant Regional Director Norman Moore at Ephrata, Washington. Sandkay Construction Company, Inc., completed construction of Agate Dam on the Rogue River Basin Project in Oregon without experiencing a single disabling injury. Work was completed during the period March 15, 1965, through April 15, 1966, which was almost 9 months ahead of the scheduled contract completion date of December 5, 1966.

The Bureau of Reclamation Construction Safety Award was presented at the jobsite to W. W. Clyde and Company of Springville, Utah, for construction of Huntington North Dam and Dikes, Emery County Project, Utah, without experiencing a single disabling injury. Shown below are (left to right) Mr. Rudolph Angeli, Field Engineer, Mr. Wesley Behling, Acting Project Construction Engineer, Mr. Norman Clyde and Mr. Cornell Clyde of W. W. Clyde and Company.



The C.S.P. Engineering Company of Casper, Wyoming, on July 5, 1966, was presented the Bureau's Construction Safety Award in recognition of that Company's exemplary safety record during construction of the Dunlap Substation north of Alliance, Nebraska. Mr. Lewis J. Nelson, Acting Construction Engineer, Cheyenne Construction Field Division, presented Mr. Carle S. Porter, owner of C.S.P. Engineering Company with the award at the North Platte River Projects Headquarters Office in Casper.



* * * * *

ACCIDENT REVIEW

HEAVY EQUIPMENT OPERATION

Activity: Bureau contractor--An oiler was fatally injured while checking the oil level of the rear engine of a Caterpillar 657 tandem scraper. The scraper had stopped to give the right-of-way to another scraper which had entered the service area. The oiler jumped on the rig to check it while it was stopped, and as the operator started forward the deceased was caught between the tire and the guard on the side of the scraper.

Cause Determination: Contrary to standard procedure, the oiler climbed onto the scraper before the bowls or "cans" were set on the ground. A scraper is not considered "dead" or fully stopped until the bowls have been grounded.

Prevention: Since tandem scrapers are unusual rigs, special consideration had been given to their use and servicing. Such procedure included a definite traffic pattern into the service area; modification of the rigs so they could be fueled from the left side and lubricated from the right side; a special lube truck was adapted for this operation; a siren to sound the "all clear" at the end of work breaks; and repeated instruction to all personnel on the proper procedures to follow. In addition, the following safety measures should be considered:

1. Attachment of a chain near the operator's seat. This chain is to be hooked up by the mechanic or oiler prior to any work being done on the rig. The operator cannot remove or cross over the chain. During service breaks a man will walk the lineup of rigs placing the chain in position. At the end of the break two men, one on each side, will walk down the line, starting at the rear, clearing each machine and then removing the chain. (See photograph on next page.)

2. A siren should be spotted at the center of the service area to be used as the signal for the end of the breaks. The siren could be adapted to any operation where the equipment is serviced during lunch breaks and at shift changes.



HEAVY EQUIPMENT OPERATION

Activity: A Bureau contractor was operating a truck-mounted mobile crane on the transformer deck between Yellowtail Dam and the Powerplant, transporting workers on a skip to reach the bushings on the 230-kilovolt power transformers. During this operation, with the boom swung over the side of the truck and the skip in a raised position, the metal deck (behind the truck cab), over which the crane counterweight travels when the crane swings, was fully exposed. A Bureau employee used this deck to spread out drawings. While lowering the skip, the operator swung the crane, permitting the counterweight to travel over the metal deck to the rear of the crane. The Bureau employee was caught between the counterweight and the deck, suffering fatal injuries.

Prevention: An automatic sounding device on the crane may have prevented this accident; however, experience has shown that routine use of a sounding device on a piece of equipment being moved constantly soon loses its effectiveness. Shields or guards might prevent this type of accident, yet set the stage for other accidents by oilers and others performing service and maintenance of the crane. This type of accident can best be prevented by diligently pursuing safety training at all employee levels, with particular emphasis on the individual's responsibility for being aware of and alert to the hazards of all types of moving machinery.

HEAVY EQUIPMENT OPERATION

Activity: A surveyor had set up his transit in the excavation for spillway footings when the contractor moved a dozer in on the slope above to cut a pad for a crane to use in placing concrete. As he cut into the hillside, a large boulder was dislodged. The boulder rolled down the slope, damaged the transit, and crushed the surveyor's ankle against the edge of excavation. At the time the surveyor moved into the area, there were six contractor personnel and four other Bureau personnel in the excavation area. Further, there was considerable noise in the area from a nearby air compressor precluding the crew from hearing the dozer.

Cause Determination: The contractor's dozer operator had a watchman with him while working on the crane pad. However, he left the area, and when he returned assumed the area was clear and resumed work without checking the area below.

Prevention: Compliance with "Safety Requirements for Construction by Contract," Paragraph 14-12, which reads as follows: Excavation crews shall not be permitted to work above one another where danger of falling rock or material exists.

HEAVY EQUIPMENT OPERATION

Description: A Bureau contractor's employee, driving a bottom-dump Euclid truck, stopped, and apparently was getting out of the cab when his truck was hit in the rear by another truck. He fell in front of the drive wheel, which rolled over him resulting in a fatal injury.

Prevention: Paragraph 9-137 of "Safety Requirements for Construction by Contract" states: "No vehicle shall be driven at a speed greater than is reasonable and proper, with due regard for weather, traffic, intersections, width and character of the roadway, type of motor vehicle, and any other existing conditions. The operator must at all times have the vehicle under such control as to be able to bring it to a complete stop within the assured clear distance ahead." It is also a good safety precaution to make certain that your rig is in the clear before you leave the cab.

ELECTRIC POWER BURNS

Description: A contractor's employee, working in the steel of one bay in a deenergized substation, climbed into an adjacent bay and came in contact with a 34,500-volt conductor at the top (customers' side) of an open disconnect switch. Burns inflicted were so severe that one leg had to be amputated.

Prevention: This accident possibly could have been prevented by observing Paragraph 21-6 of SRCC which provides: "No work shall be performed until a firm plan of operation has been mutually agreed upon by both the contractor's job superintendent and Contracting Officer's authorized representative at the site. All workmen of both prime contractor and subcontractor, shall be made thoroughly familiar with the plan before work is begun, and as frequently thereafter as necessary to insure that everyone has full knowledge of the plan of operation and the precautions necessary as the job progresses." Observing the standard rule that all existing lines, buses, and equipment be considered energized until grounds are in place would also have prevented the accident.

HOISTING EQUIPMENT OPERATION

Description: Contractor's steel foreman, directing the placing of steel on a bending bench, was struck by the falling boom of an A-frame truck and died from the injuries inflicted. Failure of the chain in the boom support lines at their anchorage to the gantry allowed the boom to fall. Investigation of the accident indicated that the chain could have been overloaded in shear as a result of the design of the anchorage. The anchorage was a keyhole-shaped slot in a metal plate which could put a severe shear loading on one link in each chain.

Prevention: More attention to the design, fabrication, and testing of job-fabricated lifting devices, along with establishing safe load limits for each such device. Also by staying out from under the booms and the load.

FALLING OBJECTS

Description: A contractor's driller was working at the toe of a cut under overhanging rock. A rock came down and struck his hand, which was on the machine. Time loss: 300 days fixed charge for amputation of finger.

Prevention: Paragraph 14-11 of "Safety Requirements for Construction by Contract" provides that men and equipment working below vertical cuts or steep slopes shall be protected from rock and falling objects by proper scaling or protective barriers.

STORAGE OF MATERIALS

Description: Contractor's miner, working in the tunnel face area helping to move the drill jumbo to the face, was pinched between the drill jumbo and a roll of wire mesh which was stored along the wall of the tunnel. Injuries included a fractured leg. The face area of this small bore tunnel does not leave much clearance around the drill jumbo and there is not room to store supplies left over from one part of the cycle until they are needed again.

Prevention: Paragraph 12-2 of "Safety Requirements for Construction by Contract," providing that materials in storage shall not interfere with thoroughfares.

* * * * *

CHEMICAL EXPLOSION IN WATER WELL DRILLING AND DEVELOPMENT

Well development solutions usually consist of a mixture of polyphosphates, soda ash, and a wetting agent. Common practice is to include calcium hypochlorite in the solution as a sterilant for the well. The solutions usually have been mixed in 55-gallon batches and wetting agents used have been liquids.

Recently on a larger job, the contractor decided to use a jet mud mixer to expedite mixing larger quantities of the solution in a 1,000-gallon tank. On this job, a dry wetting agent, Pluronic F68, was specified. A contractor employee feeding the various ingredients to the mixing hopper did not notice that the dry Pluronic had hung up in the hopper and added dry calcium hypochlorite immediately on top of it. Water from the mixer apparently moved up by capillarity to the contact between the two materials, and a violent explosion occurred, spewing molten hypochlorite over a considerable area and starting a number of small fires.

The fires were rapidly extinguished. No one was injured since the employee feeding the hopper had just turned from it to get a rod with which to break the bridge in the hopper so the material would resume feeding, and the shape of the hopper was such as to direct the force of the explosion upward.

The procedure was immediately revised to feed the Pluronic through the hopper first, then the polyphosphate and soda ash, and finally the hypochlorite. No further difficulty was encountered while following this procedure.

TWO WORKERS SUCCUMB TO FUME POISONING FROM SILVER SOLDER OPERATIONS

Two cases of fatal poisoning, one in Utah and one in California neither involving Reclamation employees were traced to improper use of silver solder containing cadmium. A second non-fatal incident was also discovered in California.

Investigation of silver solder being used by industry revealed some with a 90 percent cadmium content, with the average being from 12 to 16 percent. This solder, when overheated in soldering operations, produces cadmium fume concentrations far above the recommended atmospheric concentration (8 hours) of 0.1 milligram of cadmium oxide fume per cubic meter of air, and in many cases, without proper ventilation, produces chronic or acute exposures.

The main problem encountered is that not all silver solder contains cadmium, but many types containing cadmium have no label or have a loose small tag which reads, "contains cadmium - admits dangerous fumes if over-heated."

The seriousness of this problem can be seen from the American Industrial Hygiene Association's Hygiene Guide Series on cadmium which rates the severity of the cadmium hazard as:

High for both acute and chronic exposures. Single exposure to cadmium fume can cause severe lung irritation, which may be fatal. Most acute intoxications have been caused by inhalation of cadmium fume at concentrations which did not produce warning symptoms of irritation. Continued exposure to lower levels of cadmium in air has resulted in chronic poisoning characterized by irreversible lung injury (emphysema) with abnormal lung function and urinary excretion of a specific low molecular weight protein which may be associated with evidence of kidney dysfunction. Clinical evidence of the cumulative effects of cadmium may appear after exposure has terminated and the disease tends to be progressive.

Recommended control procedures and precautions to prevent acute or chronic exposures are as follows:

- a. Check all silver solder now being used to determine cadmium content. If solder does contain cadmium, determine if a solder of lower cadmium content or if one devoid of cadmium can be substituted.

- b. If solder containing cadmium is required, it must be properly tagged as to the cadmium content and the hazard involved.

c. All employees using the cadmium solder should be properly indoctrinated as to the hazards.

d. Adequate ventilation for soldering operations should be provided where possible and personal respiratory protective equipment, approved for protection against metal fumes or dust, can be used for temporary or supplemental control.

e. All employees having repeated exposures to cadmium dust or fumes should have preplacement and periodic medical evaluation.

--R. J. Searle, Regional Safety Officer
Region 4--Salt Lake City, Utah

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NATIONAL SAFETY COUNCIL DATA SHEETS

The National Safety Council has recently published revised or new technical data sheets on the subjects listed below. Copies of these data sheets (by numbers shown in parentheses) may be obtained from the National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

Chlorine (207 Revised)
Tick Bites (228 Revised)
Powder-Actuated Hand Tools (236 Revised)
Motor Trucks for Mines, Quarries and Construction (330 Revised)
Power Lawn Mowers (464 Revised)
Arsenic and its Inorganic Compounds (499 Revised)
Drilling in Open Pit Mines (573)
Projected Still Pictures (574)
Cutting and Clearing Vegetation (575)
Hauler-Loaders (576)
Sewer Pipe Cleaning (577)
Selenium and its Compounds (578)
Applications of Electric Plug and Receptacle Configurations (579)
Asphalt Roofing Manufacture (582)

* * * * *

FROM THE FIELD

Colorado River Storage Project, Curecanti Unit, Montrose, Colorado--Elevator Inspection: The Morrow Point contractor's manlift (elevator) was tested on May 6, 1966, and met all safety requirements. It is equipped with an overspeed governor. A free fall test was made and safety dogs permitted a drop of 19-1/2 inches. The hoist meets the safety requirements of the American Standards Association Codes A 10.4 and A 17.1, as well as Colorado State Codes.

Mr. James J. Dworak III, Safety Officer at Montrose, is shown below (left) handing out Safe Driver Awards to Skeet Hamdorf, 8 years; James Calhoon, 4 years; Leonard Robinson, 3 years; and Elbert Bean, 6 years without a reportable motor vehicle accident. The Safe Driver Awards are issued by the National Safety Council under the provisions of the Council's Safe Driver Award Program.



P594-427-139 NA

Navajo Indian Irrigation Project, Farmington, New Mexico--Turtle Club Membership Awarded Steve L. Tenski:



W. Watson Ketchen, (right) Field Engineer, hands a Certificate of Membership in the Turtle Club to Steve Tenski, Construction Inspector (left) as John E. Rogert, Civil Engineer, and Delbert E. Golightly, Project Safety Officer, look on. In addition to the membership certificate, Mr. Tenski received a wallet card, lapel pin, and a safety helmet with the Turtle Club emblem. Mr. Tenski was struck on the head by a reinforcing steel bar which fell from 8 feet overhead. The safety hat he was wearing deflected the force of the heavy blow and protected him from serious head injury.

The objective of the Turtle Club is to emphasize the importance of safety head protection. Their motto is "Shell on head -- We're not dead." The international organization, founded in 1946, is sponsored by the E. D. Bullard Company, a manufacturer of hard hats. To be eligible for membership, an individual must credit the wearing of a safety hard hat with preventing a fatal or serious head injury.

North Platte River Projects, Casper, Wyoming: On May 27, 1966, Region 7 Regional Director H. P. Dugan presented citations to employees at Fremont Canyon for having worked 2,000 days without a disabling injury and to employees at Alcova for having worked 4,000 days without a disabling injury.

Yellowtail Project Office, Hardin, Montana: Work boats No. 1 and 2 were launched on April 25, 1966, and May 16, 1966, respectively, and have been undergoing shakedown cruises and minor maintenance. Both boats were inspected by Region 6's Regional Safety Officer, Lawrence M. Hayes, Jr., and found to meet all U.S. Coast Guard requirements except one minor item which was corrected. The U.S. Coast Guard will examine and certify the workboats at the earliest opportunity.

San Juan-Chama Project, Santa Fe, New Mexico: The Bureau of Mines' film, "Danger along Haulageways," is being shown to Reclamation and contractor personnel on the project.

Yuma Projects Office, Yuma, Arizona: W. E. Barcus, Safety Officer, attended the 13th Annual Western Safety Congress and Exhibits on April 6-7, 1966, in Los Angeles, California.

Parker-Davis Project, Phoenix, Arizona--"Pulse of Life": The award-winning film, "Pulse of Life," pertaining to mouth-to-mouth resuscitation and cardiac massage, has been shown to project personnel recently.

Willows CVP Construction Office, Willows, California: A project-wide safety meeting was held June 30, 1966, with approximately 100 employees attending. Nineteen National Safety Council Safe Driver Awards were presented. Mr. Howard Hooper, Fire Control Officer, U.S. Forest Service, was guest speaker. He spoke on fire prevention, costs, reporting fires, and recreation in the National Forests.

Region 2, Sacramento, California--Award of Honor Presentation: At the annual dinner meeting of the Sacramento Area Safety Council, the National Safety Council Award of Honor was presented to Regional Director R. J. Pafford, Jr., for the outstanding safety performance by employees of Region 2 during 1965. Several hundred people attended this meeting on June 23 at the Sacramento Inn.

* * * * *

BUREAU SAFETY TRAINING--PROGRESS REPORT

Total number of employees who have completed Bureau safety training commitments since inception of these programs in 1965:

	N.S.C. Driver Improvement Training	Safety Training Course for Construction Supervisors and Inspectors	
		<u>30-hour course</u>	<u>One or more sessions</u>
Region 1	945	102	10
Region 2	1,223	109	334
Region 3	1,123	7	38
Region 4	1,057	129	51
Region 5	613	71	27
Region 6	511	49	43
Region 7	<u>1,121</u>	<u>190</u>	<u>-</u>
Totals	<u>6,683</u>	<u>657</u>	<u>503</u>

Alaska District: Due largely to the efforts of District Safety Officer J. V. House, the National Safety Council's Driver Improvement Program has reached Alaska and the Instructor Training Program was conducted on July 11 and 12. The District Safety Officer and the Property and Procurement Officer received certificates upon completion of the course. The program in Alaska is under the sponsorship of the State of Alaska, Department of Public Safety. Training kits will be made available to all State and Federal agencies for use throughout the State.

Project Safety Engineer James Winston is shown below conducting a session of the Driver Improvement Course for wives and teenage children of employees of the San Juan-Chama Project in New Mexico. All employees at the project have completed the course. It is planned to repeat the course in October for new employees and those who need to retake the training.



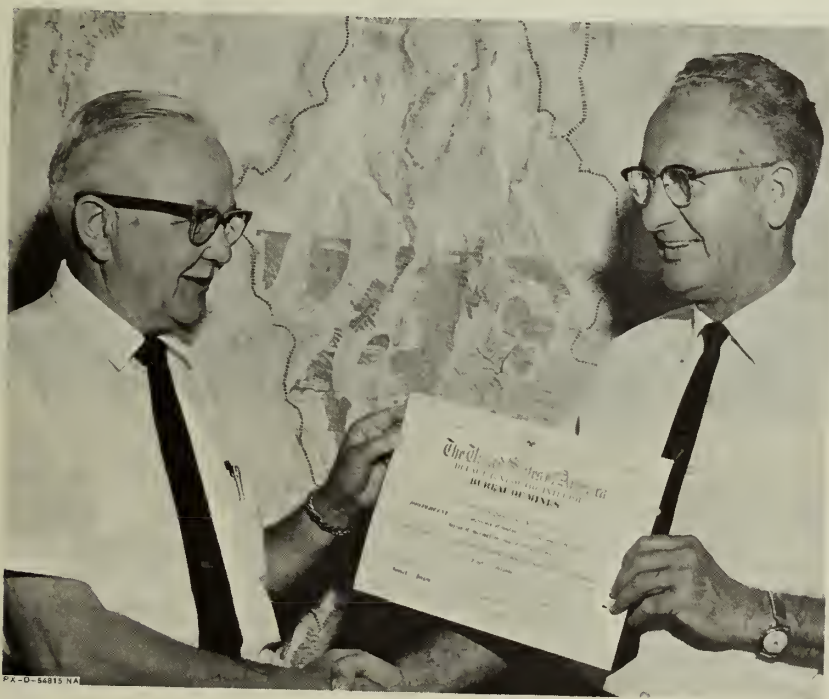
PX-D-54813 NA

Mr. Cecil E. Tackett,
 Chief, Chama Construction
 Field Division, San Juan-
 Chama Project, instructs
 a session of the Safety
 Training Course for
 Construction Supervisors



PX-D-54816 NA

Boulder City Development Office--All Employees Complete Course in
 Bureau of Mines First-aid Methods:



PX-D-54815 NA

Area Engineer C. E. McClaren (right), Boulder City Development Office, Boulder City, Nevada, is shown receiving the Bureau of Mines Certificate for 100 percent participation in the Bureau of Mines First-aid Methods from Robert S. Welsh, Region 3's Regional Supervisor of Power and Chairman of the Regional Safety Committee. Safety Officer Michael I. Grogan organized and conducted the first-aid training.

First-aid Training--Region 1, Boise, Idaho:



First-aid training classes were held in the Regional Office at Boise on June 9-12, 1966. The training was presented by C. R. Murphy (shown above at the left, standing), Safety Officer from the Spokane Valley Project, who is a certified Bureau of Mines First-aid Instructor and Examiner. First-aid certificates will be presented to W. J. Edwards, D. W. Applegate, Howard Chitwood, Harvey Olberding, and Kenneth Montrose of the Central Snake Project; Richard M. Blake, Mann Creek Project; Patricia Yandell, Ray Walters, George Sweeney and Dan Richmond from the Regional Office; William J. Scifres, Boyd O. Parker, and Frank O. Haylett, Marsing Job Corps Center. Eight of the foregoing employees also completed the 30-hour First-aid Instructor Course.

* * * * *

WATER SAFETY



The American National Red Cross

TO

C. O. Lawrence, Project Manager

IN GRATEFUL APPRECIATION

for outstanding cooperation of management
and staff of the United States Bureau of
Reclamation in the Red Cross Water Safety
Program and Annual Water Show

CHAPTER

Klamath Basin

DATE

December, 1965

H. M. Upington
CHAIRMAN

Klamath Project, Klamath Falls, Oregon: The American National Red Cross, Klamath Basin Chapter, presented Mr. C. O. Lawrence, Project Manager at Klamath Falls, Oregon, a Certificate of Appreciation (pictured above) for cooperation received from the project in conducting the Red Cross Water Safety Program and Annual Water Show.

Yuma Projects Office, Yuma, Arizona: As soon as Senator Wash Dam in California, near the Arizona border, was completed in April 1966, the Yuma Projects Office began formulating plans for water safety on the reservoir. Plans have been made for personnel and boats of the U.S. Coast Guard Auxiliary to visit and patrol the area, particularly on weekends and holidays. A meeting is planned for mid-July for the purpose of exploring the possibility of forming an Imperial County Sheriff's Water Posse for Senator Wash.

RECORD OF PUBLIC DROWNINGS

<u>Bureau-operated Facilities:</u>	1-1-66 to 6-30-66	CY65
Canals	11	22
Dams	0	0
Reservoirs	0	3
Total	11	25

Facilities Operated by Others:

Irrigation and Water Districts	5	14
State or County (Recreational)	8	39
Total	13	53

Summary of Total Drownings During Period:

By Operating Agency:

Bureau of Reclamation	11	25
Irrigation and Water Districts	5	14
State or County (Recreational)	8	39
Total	24	78

By Type of Facility:

Canals	17	34
Dams	0	0
Reservoirs	7	44
Total	24	78

By Activity:

Swimming	5	23
Boating	3*	14
Fishing	*	7
Fell into water	10	24
Other	6	10
Total	24	78

By Age:

Under 12 years of age	14	19
From 12 to 25	4	22
From 25 to 50	5	23
Over 50 years of age	1	14
Total	24	78

*All were fishing from boats.

VEHICLE SAFETY

President Johnson on Traffic Safety

The President told a group of transportation leaders: ". . . we have lost four times as many American servicemen in motor vehicle accidents as our enemies have been able to kill in all the fighting in Viet Nam. We can no longer tolerate such anarchy on wheels, we can no longer tolerate unsafe automobiles, we can no longer tolerate poorly planned and badly lighted highways, we can no longer tolerate inadequate licensing procedures, we can no longer tolerate ineffective safety programs that result from the complete lack of basic research into the real cause of accidents." In pressing for his proposed legislation, he said: "The Highway Safety Act of 1966 will move us out of the Stone Age of ignorance and inaction . . . it will establish a program of strict safety standards for our automobiles. I cannot over-emphasize the need for such standards. The alternative to federal standards is unthinkable--50 different sets of standards for 50 different states."

THE GSA REQUIREMENTS

The General Services Administration is an automobile buyer in a big way. GSA purchases cars for the Federal Government, which maintains a 36,000-car fleet.

The 1967 models, which GSA ordered recently, must have these safety devices as standard equipment:

1. Padded dash and sun visors.
2. Recessed instruments and controls on the instrument panel.
3. Impact-absorbing steering wheel and steering column.
4. Safety door latches and hinges.
5. Anchorage for seat belt assemblies.
6. Anchorage of seats.
7. Dual-brake system.
8. Standard gear quadrant (P-R-N-D-L).
9. Safety glass.
10. Glare-reduction surfaces on the instrument panel and windshield wipers.
11. Tires that meet Federal specifications (no overloading at curb weight or GVW rating) and safety rims.
12. Exhaust emission control system.

13. Constant speed (at least two speeds) windshield wipers and washers.
14. Standard bumper heights.
15. Four-way signal flasher.
16. Backup lights.
17. Outside rearview mirror.

Some of the items on the GSA list have been standard on autos for the last several years. Others are offered as optional accessories. Still others will require innovations on most models on the market.

The GSA hope is to encourage auto manufacturers to offer these safety devices as standard equipment, rather than as accessories, if at all. The size of the GSA fleet, combined with the influence of the Federal Government in setting an example for the public, puts teeth in the GSA objective.

MOTOR VEHICLE ACCIDENTS--SCOPE OF EMPLOYMENT

Defense of Suits against Federal Employees under Public Law 87-258

On March 13, 1962, the Department of the Interior Solicitor summarized the provisions of subject law in a memorandum stating in part as follows:

"Public Law 87-258 provides, in effect, that any civil action or proceeding brought in any court against any employee of the Government, or his estate, for damage to property or for personal injury, including death, resulting from the operation of any motor vehicle while the employee was acting within the scope of his employment will be deemed to be an action or proceeding against the United States and will be defended by the Attorney General. This Act will become effective on March 21, 1962."

The determination for the purpose of subject law of whether an employee was acting within the scope of his employment is made by the United States Attorney for the district in which the civil action or proceeding is brought. At a Federal Safety Council meeting March 22, 1962, Mr. Russell Chapin, Executive Assistant Civil Division, Department of Justice, is reported in an account of the meeting as having expressed the following opinion in answer to the question, "Can you tell me when a man is acting within the scope of his employment?"

"If the Federal Tort Claims Act set up a uniform standard for application throughout all of the 50 states it might be possible to tell you. The Federal Tort Claims Act does not do that. It in effect, refers the litigant back to the law

of the State where the negligence took place. So in determining whether or not your Government driver was acting in the scope of his employment you have to look at the law of the State where his negligence took place. The Attorney General by delegating his authority to make the determination of the scope of employment to the United States Attorney, subject to supervision of course in the Civil Division, has placed responsibility with an officer of the Government who is familiar with the law of that particular State. I am confident that you will find that the U.S. Attorneys will attempt to give body to the spirit of this legislation."

There is practically no doubt that an employee is within the scope of his employment when he is traveling the normal route between authorized destinations in a vehicle he is authorized to use. Written authorization is not a necessity, but it would make a more clear-cut case.

Conversely, an employee who was off the normal route between authorized destinations or was engaged in the furtherance of his own personal interests, or not authorized to use the vehicle may not be acting within the scope of his employment.

Between the two situations, it is practically impossible to give definite guidance except that the individual should let his own good judgment and conscience be his guide.

* * * * *

WHY FASTEN YOUR SEAT BELT?

The American College of Neurosurgeons reports that of the 33,000 people dying from head injuries suffered in traffic accidents in the United States last year, 16,000 would very likely have survived had they been wearing seat belts.

* * * * *

SAFETY SAVES

Many contractors know that good job safety is a paying partner. In the case of W. J. Barney Corporation of New York, they have found that their insurance premiums are 25 percent less than the construction industry average. According to an article on the May 5, 1966, issue of "Engineering News-Record," over the last 5 years the Company has saved \$198,000 in doing \$75 million of work. This saving allows them to bid just that much closer and know that they have this advantage over the average contractor.

It is too bad that we have to consider safety in terms of money, when all the personal pain is involved, but dollars are one thing that everyone understands, particularly contractors.

The methods W. J. Barney Corporation uses for maintaining a good safety record are not unique or difficult to follow. Actually, the methods are the same as the safety engineers have been teaching and following for a long time. In general, the contractor's plan is as follows:

1. Make safety plan before work starts
 - a. Visit site with insurance agent
 - b. Set up medical procedures
 - c. All supervisors informed of safety plan
2. During job construction
 - a. Superintendent key safety representative
 - b. Weekly safety meetings and inspections
 - c. Periodic safety inspection by home office
 - d. Insurance agent proposes safety improvements
 - e. Detailed accident reporting and followup
 - f. Pursue a positive prevention policy

The contractor has found that public liability accidents are occurring more frequently and are resulting in larger claims. This has resulted in more intense protection to keep the public out of the working area. When accidents do occur, a policy of very detailed reporting, pictures, statements of witnesses, and fast settlement is followed.

Arthur T. Gaffney, Vice President, directly responsible for the safety role of the corporation, follows the principle that a good safety record is good business. Direct cost savings are in the rates charged by the insurance carrier and indirect costs are reflected in better job morale, less lost time and less damage to equipment and materials.

Contractors that are progressive have found that job safety pays in actual savings and therefore places them in a more favorable bidding position. We in the Bureau can consider safety in a similar way in savings to the Government in the work we do.

--T. E. Mann, Regional Engineer
Region 6--Billings, Montana

PRESENT AND PROPOSED PROJECTS IN CALIFORNIA AND THEIR RELATED SAFETY ASPECTS

Presented by
Robert J. Pafford, Jr., Regional Director, Bureau of Reclamation

at the

14th Annual California Safety Congress and Exhibits
San Francisco March 10, 1966

Thank you for inviting me to appear on your program today. Before I discuss the safety aspects of the Bureau of Reclamation's operations in Region 2, I would like to discuss briefly our water development program, primarily in California, as it is now and as we see it in the future.

Region 2 extends from Oregon to the Tehachapi Mountains, including the major part of Nevada. The Bureau has been active in this region since the early 1900's when it built the Orland Project in California, the Newlands Project in Nevada and the Klamath Project on the Oregon-California border. Since then we have built other relatively small projects such as Monticello Dam just northeast of San Francisco; the Cachuma, Santa Maria and Ventura Projects along the coast south of here; and the Humboldt Project in Nevada.

But the main Bureau activity in this Region has been and continues to be the construction and operation of the Central Valley Project.

In the 1920's, with the help of studies prepared by the Bureau and other Federal agencies, the State Legislature developed a plan to store the runoff from the mountain streams in the northern part of the state and to distribute surplus water to the south. The plan was approved by the voters and in 1933 authorization was given to sell the revenue bonds needed for its implementation. But the depression of the 1930's made it impossible for the State to carry out this plan. The State appealed to the Congress of the United States for help and Congress responded in 1937 by authorizing construction of the Central Valley Project by the Bureau of Reclamation.

Today water is stored behind Trinity and Shasta Dams in the northern part of the state, behind Folsom Dam near Sacramento, and behind Friant Dam near Fresno for distribution as far south as Bakersfield and as far west as Martinez. Through a series of canals, pumping plants and tunnels, and exchange agreements, the Central Valley Project makes possible the beneficial use of water as much as 500 miles from its source and at points all along the delivery route. It prevents floods, provides low-cost power, and stabilizes river flows to improve navigation and enhance fish and wildlife resources. The water it produces is used for farming, for drinking and for supplying the needs of

industry. The lakes formed by the Bureau's great dams draw more than 10 million visitors in search of recreation in Region 2 each year.

Despite the fact that the Bureau has already spent more than a billion dollars on water development in the Central Valley, the Bureau foresees the need of much greater development in the future if California is to meet the needs of its rapidly growing population. We already are at work on the addition of another billion dollars worth of dams and powerplants, pumping plants and canals, tunnels and reservoirs in the Central Valley, and are making plans for the addition of several more billions of dollars worth of facilities.

We are about half-way through the construction of the San Luis Unit of the Central Valley Project, which includes the 3-1/2-mile-long San Luis Dam and the San Luis Canal, 103 miles long and 207 feet wide. Many facilities of this unit will be used jointly with the State of California. The Bureau is building these joint use facilities, and the State will operate them. Construction, operation and maintenance costs will be shared, resulting in the savings of many million dollars to each agency.

We are building also the Tehama-Colusa Canal which will run more than 100 miles south along the west side of the Sacramento River starting at Red Bluff. If Congress approves the President's budget recommendations, we will start construction on Auburn Dam, the highest earthfill dam ever constructed by the Bureau, sometime after the start of the fiscal year beginning July 1. In Nevada, we have plans to start construction on the Washoe Project, which includes Stampede and Watasheamu Dams, during the coming fiscal year.

Our future plans include the extension of the Tehama-Colusa Canal into Yolo and Solano Counties; the East Side Division, which would carry water down the east side of the San Joaquin Valley into the Bakersfield area; the San Felipe Division, which would divert water from San Luis Reservoir through the Pacheco Tunnel into Santa Clara, San Benito, Santa Cruz and Monterey Counties; the Cosumnes River Division, which would develop water for irrigation, municipal and industrial use in Amador, El Dorado, Sacramento and San Joaquin Counties; the Kellogg Unit, which would provide quality water, flood control and fish, wildlife and recreation benefits to the western Delta area; the Allen Camp Unit, which would benefit areas in Modoc and Lassen Counties; and the Peripheral Canal, which would carry water around the Delta to pumping plants near Tracy.

In addition, we are hard at work on plans for controlling floods and developing water and power in northwestern California for local use, with the surplus available for distribution in central and southern California.

Our primary purpose is to help California and the other states in this region meet their rapidly growing water needs. One of the main concerns in the achievement of this goal is safety--the safety of our own employees, the safety of the employees of the contractors who work with us, and the safety of the public which visits our facilities.

In working out our safety program, we have attempted to follow the principle that safety is as much a part of our supervisors' responsibility as are the maintenance of quality and the meeting of production goals.

Commissioner of Reclamation Floyd Dominy enunciated this principle clearly in an address presented to the National Safety Congress in Chicago in 1963. The Commissioner said:

"Aggressive management participation and personal involvement are essential to the success of any safety effort. Health and safety should be considered in all management decisions relating to the methods of doing business."

We not only exhort all Bureau supervisors to maintain the highest standards of health and safety in all operations; we also make the supervisor personally responsible for the compliance with safety requirements in all operations under his supervision to the same extent that he is responsible for the quality of the product and the completion of the work.

In our contract work, we have made safety responsibility an integral part of the job for our construction supervisors and inspectors. We require all construction supervisors and inspectors to complete the safety training course for construction supervisors prepared by the Associated General Contractors of America.

We require further that all Bureau field supervisors be trained in a standard first aid course, and we extend this requirement by insisting that all contractors' foremen be similarly trained.

One of the major safety programs we have initiated is the requirement that all of our employees who drive government cars must take a 10-hour driver improvement course. This is a major safety consideration in our region, since our employees are now driving more than 9 million miles a year.

The work done by some of our employees who travel creates special problems and involves special hazards. For example, we have working for us land acquisition personnel who are gone from our regional headquarters for days, weeks and sometimes months at a time, working completely on their own, driving thousands of miles over all sorts of roads in all sorts of conditions over vastly varying terrain.

Then we have our ditchriders who patrol hundreds of miles of canals through the Central Valley. These employees also are out on their own without immediate supervision, driving over narrow, twisting, treacherous canal roads at all hours of the day and night. At many places, they must pull out from these hidden roads and cross major highways, with no traffic lights, no marked intersections, no protection whatsoever except their own alertness and driving skill. In addition to maintaining excellent driving and personal injury records, our ditchriders have on occasion saved animals--and people--from drowning in our canals. This requires special training, too, as unless the proper method of rescuing persons from the canal is followed, a single tragedy might easily be converted into a double tragedy.

Among our own employees, there are probably none who are subjected to more opportunities to injure themselves than the employees of our Folsom Field Division. These men operate and maintain our facilities at Folsom Dam and at our Elverta Switchyards. At different times these men are exposed to possible injury from working with electricity, from working at heights, from working with power tools, and from working on and near the water.

But our Folsom Division has compiled the outstanding safety record in our region--and one of the most outstanding in the Bureau of Reclamation. Much of the credit for that fine record must be given to one man--Bill Smith, the chief of that division since October 1955.

Shortly after Bill was appointed chief, an accident occurred at the Nimbus Powerplant, which resulted in serious injuries to three of his employees. Bill vowed that such an accident would not happen again. He has initiated and carried out a safety program at Folsom that has made every one of his employees as safety conscious as a man back on the job the first day after getting out of the hospital. And it has paid off. Since then, the Folsom Division has had one accident--a knee injury which resulted in 10 days lost time--and has gone from November 27, 1957, until now without a single lost time accident.

This exceptional record is the result of Bill Smith's determination, and his development of a tightly knit safety organization which stems from him down through the various echelons to the lowest grade employee. Management is definitely and obviously involved--and the morale of our Folsom Division employees couldn't be higher.

This bears out Commissioner Dominy's contention that top management must be directly involved in order to achieve a top notch safety program. The Bureau's Chief Safety Engineer from Denver, Mr. Howard Latham, is here today, representing the Chief Engineer, Barney Bellport. Mr. Bellport is as concerned as I am with our contractor safety problems, and considers safety as much a part of his job as preparing plans and issuing specifications.

And I must say we do run into some unusual problems working with our contractors as well as working with our own people.

First of all, we sometimes have as many employees on contractors' payrolls on a single job as we have on our own payroll throughout the region. This has been true on our San Luis Unit construction during the past couple of years.

Prior to the start of any construction job, our project construction engineer meets with the contractor's top personnel in a preconstruction safety meeting. Our safety requirements are outlined at this meeting and the contractor is told unequivocally that these requirements are as much a part of our specs as production, quality control or anything else and that compliance is mandatory.

The contractor must submit to us a proposed safety program before he can start operations; he must provide for 5-minute safety talks each week at the worksite; he must provide adequate facilities and trained personnel to insure prompt and efficient first aid and medical care to injured employees; he must designate a competent supervisory employee to carry out his safety program. If the size of the job warrants, we insist that the contractor employ a full-time, qualified safety engineer.

If we notice any violation of our safety rules, we serve notice in writing to the contractor and insist that he correct unsafe conditions or practices. If he fails to comply, we have the authority to shut down the job until satisfactory corrective action is taken. Of course, most contractors are willing and anxious to cooperate with us and we seldom have to invoke such drastic measures.

Construction at San Luis has presented many safety problems. The enormity of the operation is almost unbelievable. The dam itself is 3-1/2 miles long and the canal is 103 miles long. On any day, there are many different groups of men working over a stretch of 100 miles, under many different contractors, in many different phases of construction work.

Just the traffic control at San Luis Dam is a major safety project. There is a fleet of 100-ton trucks working around the clock hauling earth from a huge excavation wheel capable of filling a 100-ton truck in less than a minute. Construction and maintenance of haul roads from the borrow area to the dam is a major highway job. The traffic patterns must be exact to avoid delays or collision, but flexible enough to allow changing them, sometimes hourly, to meet changing conditions. In addition to the huge trucks, there are scrapers and other smaller trucks sharing the same roads. Bureau personnel as well as the contractors' employees must be constantly informed of changing traffic patterns through placement of signs and verbal communication.

So far more than 60 million yards of earth have been placed in San Luis Dam without a single serious accident resulting in injury or damage to major hauling equipment.

Perhaps the most hazardous operation presently being performed at San Luis is the construction of the Pacheco Inlet Channel and Tunnel. This tunnel will eventually carry water through the Coastal Range to the San Jose area. The ground conditions are unstable and unpredictable.

Because of the unstable nature of this ground, rockfalls still occur during loading and wiring up operations before blasting, even after several scaling operations have been completed.

We have had to require the contractor to take special measures to combat these conditions--including the assignment of men solely as look-outs to closely watch the unsupported ground while men are temporarily exposed to danger.

In addition to our activities at San Luis, we are now locating a 750-kv. direct current transmission line stretching from the Oregon border to a point near Las Vegas, Nevada. During the initial clearing and surveying period, both Bureau surveyors and inspectors and contractors' employees must work in uninhabited areas, sometimes many miles from the nearest telephone. These employees literally face hazards ranging from frostbite to snakebite to sunstroke, since they will be working from the northern mountains of Nevada to its southern deserts. Often many of these men are out on the line for weeks at a time, with minimal supervision. Each of these men must be given a thorough safety indoctrination before going into the field. So far our program appears to be effective--we haven't had a single disabling injury to either a Bureau or a contractor employee.

During the past 3 years we have made a great improvement in our safety program and in our safety record. In 1965, we had an accident frequency rate in the region of 0.47 per million man-hours worked and a severity rate of 38 days lost per million man-hours. That frequency rate is the lowest ever attained by any region within the Bureau. Our Region 2 employees also ended up 1965 with a motor vehicle accident rate of 1.9 per million miles driven, the lowest in the Bureau.

Naturally I am proud of this record--and of Bob Cary, our Safety Officer, and of all of our top management and all of the employees who helped establish these records. Proud, but not satisfied. We still have work to do, particularly in the area of contractors' employees safety.

Our contractors finished 1965 with a frequency rate of 15.4 and a severity rate of 4,042. For the heavy construction and tunneling work being performed, this is below the national average, but it's not good enough. I hope we can reduce these rates by at least one-third in 1966. We are concentrating even greater efforts now on training programs for construction supervisors and inspectors on contract work, and will continue our efforts to involve all of our employees, from top management through the lowest grade clerks, in a safety program designed to make everyone as safety conscious as our Folsom Division employees. They have proved--by going 9 years without a disabling injury--that accidents can be eliminated. We don't intend to stop trying until they are.

We in Region 2 of the Bureau of Reclamation are dedicated to doing all that we can to help supply California with adequate water to assure its continued growth; we are dedicated also to the completion of this task as safely as is humanly possible.

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

2nd QUARTER, 1966.

PERIOD FROM JANUARY 1, 1966 THROUGH JUNE 30, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL *		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Washington Office	287	291,592					
Denver Office	1,560	1,519,935	1		5	0.7	3
Alaska District	43	42,367					
REGION 1							
Poiss Regional Office	183	150,816	1		3	6.6	20
Baker Project	26	22,621					
Central Snake Projects Office	44	39,873	1		1	25.1	25
Chief Joseph Dam	27	26,037					
Columbia Basin Project	886	884,744	8		269	9.0	304
Hungry Horse Project	52	54,242					
Lower Columbia Development Office	50	42,885					
Mann Creek Project	19	15,275	1		59	65.5	3,861
Minidoka Project	71	85,578	1		19	11.7	222
Rogue Project		4,560					
Snake River Development Office	49	49,206					
Spokane Valley Project	35	36,958					
The Dalles	9	9,737					
Upper Columbia Development Office	51	43,785					
Yakima Project	34	27,839					
Totals & Averages	1,536	1,494,150	12		351	8.0	235
REGION 2							
Sacramento Regional Office	636	661,185					
Auburn Field Office	41	23,496					
Cachuma Operations Field Branch	2	2,064					
Central Coast Dev. Field Branch	6	6,192					
Folsom Field Division	71	73,450					
Fresno CVP Construction Office	110	113,896					
Fresno Field Division	149	151,064					
Klamath Project Office	24	25,994					
Lahontan Basin Projects Office	32	34,192					
Napa Development Field Branch	8	8,608					
Red Bluff CVP Construction Office	93	98,528					
Reno Transmission Lines Office	28	30,794					
San Luis Unit CVP Construction Office	538	600,727	1		25	1.7	42
Shasta Field Division	140	135,607					
Solano Operations Field Branch	2	2,064					
Tracy Field Division	173	177,519					
Upper North Coast Field Branch	4	4,128					
Willows CVP Construction Office	128	122,520					
Totals & Averages	2,185	2,292,268	1		25	0.4	11
REGION 3							
Boulder City Regional Office	192	168,000					
Boulder City Development Office	19	20,592					
Boulder Canyon Project Office	159	154,381					
Dixie Project Office	31	43,672					
Parker-Davis Project Office	320	337,719					
Phoenix Development Office	119	116,480					
Tuma Project Office	198	209,200					
Lower Colorado River Control:							
Cibola Field Division	90	84,528					
Laguna Field Division	18	16,455					
Needles Field Division	51	44,750					
Palm Verde Field Division	19	18,267					
Southern California Dev. Office	40	40,636					
Totals & Averages	1,256	1,254,680					
REGION 4							
Salt Lake City Regional Office	270	277,154					
Central Utah	156	150,337					
CRSP Power Operations	197	209,391	1		6,000	4.8	28,654
Circumcised Unit	169	178,684					
Durango	31	35,969					
Emery County	19	28,904					
Glen Canyon Unit	169	183,292					
Grand Junction Projects	113	109,012					
Logan Development Office	13	12,836					
Lyman Project	26	13,788					
Seedskadee Project	29	28,282					
Upper Green River	9	8,702					
Weber Basin Project	105	119,764	1		4	8.3	33
Totals & Averages	1,306	1,356,315	2		6,004	1.3	4,497
REGION 5							
Amarillo Regional Office	127	116,838					
Albuquerque Development Office	41	42,073					
Arbuckle Project	38	49,457					
Austin Development Office	50	47,926					
Canadian River Project	143	170,458					
Lower Rio Grande Project	3	3,896					
Middle Rio Grande Project	205	219,791	1		40	4.5	182
Navajo Project	24	80,492	2		30	24.6	373
Oklahoma City Development Office	24	19,130					
Rio Grande Project	229	233,148					
San Juan-Chama Project	72	67,924					
Totals & Averages	1,016	1,051,133	3		70	2.9	67
(Continued)							
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

2nd QUARTER, 1966

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT
GOVERNMENT FORCES

PERIOD FROM JANUARY 1, 1966 - THROUGH June 30, 1966

PERIOD FROM JANUARY 1, 1966 - THROUGH June 30, 1966							
REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL*	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	193	183,276	2		45	10.9	246
Canyon Ferry Project	20	15,578					
Port Peck Project	37	35,763					
Missouri-Oahe Projects	185	188,320	1		5	5.3	27
Missouri-Souris Projects	142	117,561	2		39	17.0	332
Power System Operations Office	43	44,240					
Riverton Projects	10	9,599					
Upper Missouri Projects	116	107,412					
Yellowtail Project	107	106,313	1	1	6,000	9.4	56,437
Totals & Averages	853	808,062	6	1	6,089	7.4	7,535
REGION 7							
Denver Regional Office	231	227,896					
Fryingpan-Arkansas Project	244	231,440	2		36	8.6	156
Kansas River Projects	246	255,936					
Niobrara-Lower Platte Projects	102	125,192	1		5	8.0	40
North Platte River Projects	267	304,720					
South Platte River Projects	168	167,784	2		57	11.9	340
Totals & Averages	1,258	1,312,868	5		98	3.8	75
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (1965)	11,300	11,423,391	30	1	12,642	2.6	1,107
* FATALITIES INCLUDED IN TOTAL DISABLING	11,112	23,061,414	64	0	6,087	2.8	264

JOB CORPS CONSERVATION CENTERS

JCS CORPS CONSERVATION CENTERS								
Columbia Basin Job Corps Center								
Staff	49	68,166	1		4	14.7	59	
Corpsmen	82	281,288	1		2	3.6	7	
Marling Job Corps Center								
Staff	39	89,460	2		6	22.4	67	
Corpsmen	115	285,120	1		17	3.5	60	
Leviston Job Corps Center								
Staff (including 1 VISTA)	46	140,064	1		4	7.1	29	
Corpsmen	198	565,424	4		12	7.1	21	
Toyon Job Corps Center								
Staff (including 1 VISTA)	38	90,736						
Corpsmen	98	261,392	2		15	7.7	57	
Collbran Job Corps Center								
Staff	34	31,004						
Corpsmen	120	303,480	2		22	6.6	73	
Weber Basin Job Corps Center								
Staff	52	49,632						
Corpsmen	206	450,176						
Arbuckle Job Corps Center								
Staff	29	79,744						
Corpsmen	103	300,090	1		20	3.3	67	
McCook Job Corps Center								
Staff	46	122,608	2		10	16.3	86	
Corpsmen	192	334,848						
Casper Job Corps Center								
Staff	39	92,256						
Corpsmen	100	267,920						
TOTAL STAFF	370	758,374	6		24	7.9	32	
TOTAL VISTAS	2	5,246						
TOTAL CORPSMEN	1,214	3,049,738	11		88	3.6	29	
CONSOLIDATED TOTALS								
TOTALS LAST YEAR (1965)	1,586	3,813,408	17		112	4.5	29	
	1,208	2,376,952	10	1	6,036	4.2	2,539	
*FATALITIES INCLUDED IN TOTAL DISABLING								

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

2nd QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH June 30, 1966

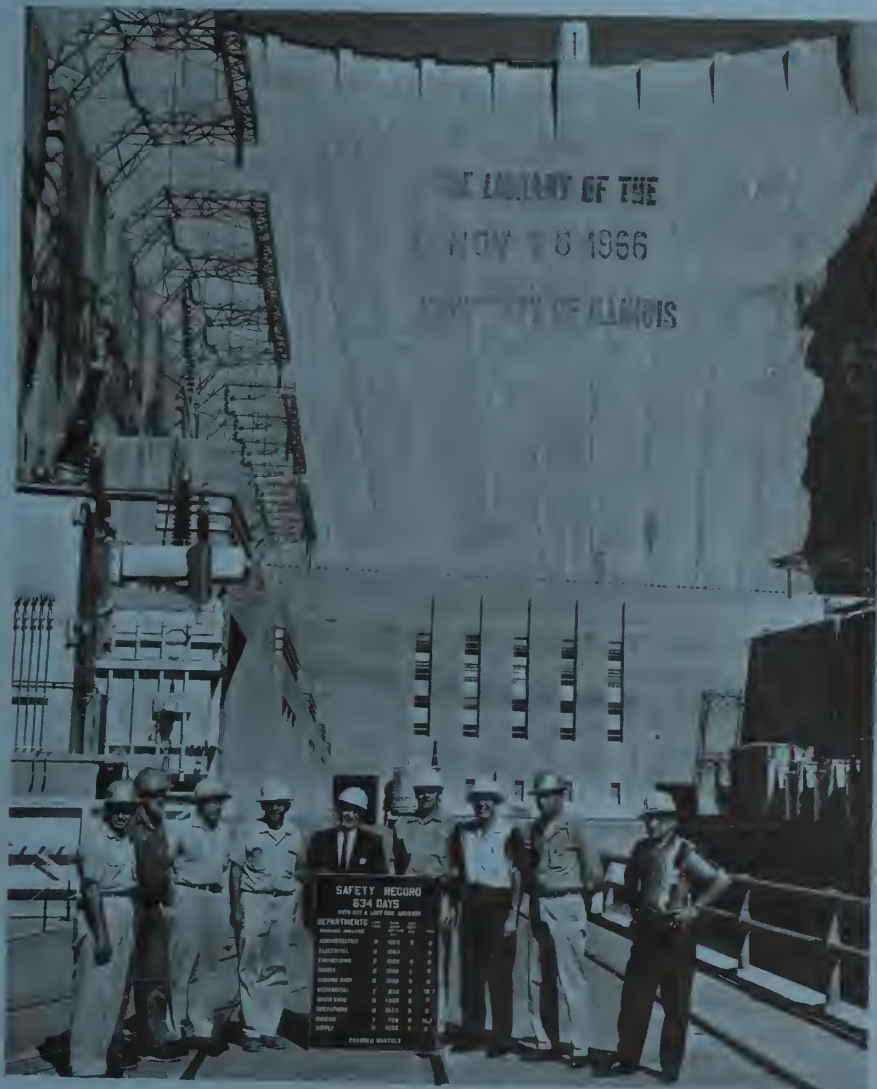
REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL #	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
DENVER OFFICE	197	166,650					
REGION 1							
Baker Project	66	44,339	3		45	67.7	1,015
Chief Joseph Dam	8	25,756	1		45	38.8	1,747
Columbia Basin Project	165	161,522	3		10	18.3	61
Mann Creek Project	75	50,857					
Minidoka Project	6	831					
Rogue Project		5,026					
Snake River Development Office		920					
Spokane Valley Project	73	61,372					
The Dalles Project		2,480					
Takina Project	10	9,035					
Totals & Averages	403	364,138	7		100	19.2	275
REGION 2							
Fresno CVP Construction Office	63	32,803					
Fresno Field Division		5,365					
Red Bluff CVP Construction Office	188	171,928	1		60	5.8	349
Reno Transmission Lines Office	18	24,652					
San Luis Unit CVP Construction Office	2,108	1,911,649	18	2	17,354	9.4	9,078
Shasta Field Division	4	8,564					
Tracy Field Division	1	1,713					
Willows CVP Construction Office	356	237,936	2		93	8.4	391
Totals & Averages	2,738	2,394,610	21	2	17,507	8.8	7,311
REGION 3							
Cibola Field Division	50	13,811					
Needles Field Division		4,258					
Palo Verde Field Division	41	67,548					
Parker-Davis Project Office	143	169,236	5		148	29.5	875
Yuma Projects Office	22	18,721					
Totals & Averages	256	273,374	5		148	18.3	543
REGION 4							
Central Utah Projects	10	9,192					
Guerreant Unit	638	624,371	2		180	3.2	288
Durango Projects		9,510	1		1	105.1	105
Emery County Project	11	27,451					
Glen Canyon Unit	202	289,343	3		175	10.4	605
Grand Junction	200	125,221	4		25	31.9	200
Lyman Project	43	13,883	1		300	72.0	21,609
Sedskadee Project	28	39,241	1		9	25.5	229
Weber Basin Project	78	47,328	2		253	42.2	5,388
Totals & Averages	1,210	1,185,540	14		945	11.8	797
REGION 5							
Amarillo Regional Office	28	16,273					
Arbuckle Project	183	186,073					
Austin Development Office		548					
Canadian River Project	720	695,336	6		384	9.0	577
Natalo Project	215	254,525	10	1	6,152	39.3	24,170
Rio Grande Project		360					
San Juan-Chama Project	321	326,273	9	1	6,350	27.6	19,556
Totals & Averages	1,467	1,449,388	25	2	12,916	17.2	8,911
REGION 6							
Fort Peck Project		919					
Missouri-Oahe Projects	18	8,821					
Missouri-Souris Projects	26	3,300					
Riverston Projects		5,425					
Upper Missouri Projects	160	60,848	1		7	16.4	115
Yellowtail Project	222	245,595	1		8	4.1	33
Totals & Averages	426	325,069	2		15	6.2	46
REGION 7							
Denver Regional Office		20,166					
Fryman-Arkansas Project	698	437,390	9		626	26.6	1,431
Kansas River Projects	443	375,517	6	2	12,020	16.0	32,009
Nebraska-Lower Platte Projects	171	56,312					
North Platte River Projects	53	31,109	1		4,500	32.1	144,653
South Platte River Projects	6	944					
Totals & Averages	1,371	921,428	16	2	17,146	17.4	18,608
CONSOLIDATED TOTALS	8,068	7,080,397	90	6	48,777	12.7	6,889
TOTALS LAST YEAR (1965)	7,181	15,624,209	223	8	58,084	14.3	3,718

*FATALITIES INCLUDED IN TOTAL DISABLING

MISSION
SAFETY

70

RECLAMATION SAFETY NEWS



THIRD QUARTER 1966



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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TABLES

Safety Performance Record

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Front Cover Photo: Safety Achievement--Boulder Canyon Project supervisors and members of the Safety Committee are shown on the transformer deck of Hoover Dam commemorating the achievement of 500,000 man-hours without a disabling work injury. Pictured from left to right are: Messrs. Clayton T. Glenn, Arthur R. Denison, Bruce A. Smith, Thomas C. Nelson, Marc Burbridge, J. M. Boyles, D. O. Towne, Herbert H. Quinn, and D. D. Johnson. Marc Burbridge, the Regional Safety Officer, participated in the commemoration, congratulating the group for an exemplary safety achievement. P45-D-56097NA

BUREAU SAFETY PERFORMANCE

1966 CUMULATIVE SAFETY RECORD
January 1 - September 30, 1966

A. GOVERNMENT FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Alaska District	0.0	0.0	0	0.0
Region 3	0.0	0.0	0	2.5
Region 2	0.5	1.2	38	3.8
Region 7	1.9	3.1	62	2.1
Region 5	5.1	5.2	98	3.9
Region 1	12.8	5.8	220	2.7
Region 4	29.9	1.0	2,988	2.7
Region 6	<u>253.2</u>	<u>5.0</u>	<u>5,063</u>	<u>2.6</u>
Totals to date	18.2	2.4	760	3.1
Totals 1965	7.4	2.8	264	2.9
Job Corps Conservation Centers:		4.4	1,031	32.0

B. CONTRACTOR FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	18.6	14.0	133	0
Region 1	60.6	19.8	306	0
Region 2	604.7	9.7	6,234	3
Region 4	866.2	11.8	7,341	2
Region 5	926.0	14.8	6,257	2
Region 3	1,678.5	20.5	8,188	0
Region 7	<u>2,378.1</u>	<u>14.8</u>	<u>16,068</u>	<u>4</u>
Totals to date	931.7	12.7	7,336	11
Totals 1965	531.7	14.3	3,718	8

*Injury index is equal to frequency rate times severity rate divided by 100.

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1966
Third Quarter

Cumulative to Date:
September 30, 1966

A. ACCIDENT CLASSIFICATION:

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Vehicles	9	281
Electricity	1	6,000
Flash burns	1	6
Chemical burns	1	4
Handling materials and equipment	10	213
Falling objects	3	174
Falls of persons	9	193
Flying particles	1	5
Handtools	1	8
Machinery	4	6,114
Other (tick bite)	<u>1</u>	<u>4</u>
	41	13,002

B. OPERATIONAL SUMMARY:

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	6,951,861	7	152	1.0	22
Construction	3,646,181	8	6,312	2.2	1,731
Investigation	1,810,033	6	90	3.3	50
Power O&M	2,610,960	11	6,233	4.2	2,387
Irrigation O&M	<u>2,092,668</u>	<u>9</u>	<u>215</u>	<u>4.3</u>	<u>103</u>
Totals	17,111,703	41	13,002	2.4	760

C. SERIOUS ACCIDENTS:

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
1-11-66	Foreman III Lineman	Electric power burns	6,000 (Nonfatal)
6-16-66	O&M Superintendent	Crushed by mobile crane	6,000 (Fatal)

SAFETY AWARDS

CONSTRUCTION SAFETY AWARDS

Foley Brothers, Inc., St. Paul, Minnesota, completed their contract under Specifications No. DC-6053 for Yellowtail Afterbay Dam without experiencing a single disabling injury. This contract, valued in excess of \$2,400,000, was awarded April 17, 1964, and completed April 25, 1966, with 302,514 man-hours of exposure accumulated. Reclamation's Construction Safety Award was presented to Mr. Tom Canfield, Project Superintendent for Foley Brothers, Inc., in the Bureau's Yellowtail Project Office, Hardin, Montana. Shown at the presentation are, left to right: W. E. Markus, Office Engineer; J. R. Granger, Project Construction Engineer; Mr. Canfield; Donald J. Duck, Field Engineer; and Leonard R. Rohrer, Chief Inspector.



P45-D-56098 NA

E. D. Baker Construction Company earns Construction Safety Award by completing five recreational contracts on the Canadian River Project, covering 47,253 man-hours, without a disabling injury. The value of the contracts totaled close to half a million dollars.



P662-525-5579 NA

George W. Finger (left), President of the Canadian River Municipal Water Authority and Chairman of the Board of the First National Bank of Borger, Texas; E. D. Baker (center) of the E. D. Baker Construction Company, and C. O. Crane (right), Project Construction Engineer, at a ceremony in which Mr. Baker was presented the Bureau of Reclamation Construction Safety Award.



The Spokane Valley Project, Spokane, Washington, awarded a Certificate of Merit to Emmett Nelson, Inc., on September 22, 1966, for construction of the operation and maintenance headquarters facilities in Greenacres without a disabling injury. The Company has substantially completed a second contract for the earthwork and structures for completion of 34 deep well pumping plants. Pictured above are, left to right: C. R. Murphy, Bureau's Project Safety Officer; Emmett Nelson; E. J. Brannan, Project Construction Engineer.

Five other contractors have previously completed contracts and been presented similar awards by the Spokane Valley Project: E. A. Holman Drilling Company, Holman Drilling Corporation, Tall Tree Service, Barlow & Son, and Rex Rainbolt. Lester N. Johnson Company and Chicago Bridge and Iron Company are presently engaged in laying pipe and the erection and painting of 11 elevated tanks under Specifications No. DC-6272. Contractors on the Spokane Valley Project have now worked almost 160,000 man-hours without experiencing a disabling injury.

* * * * *

FROM THE FIELD

Region 3, Boulder City, Nevada--Regional Office Graduates Its First Class in Bureau of Mines First Aid Methods:



P45-F-56100 NA

Resusci-Anne, the "Safety Dummy," cooperates willingly as recent first aid graduates practice their newly learned methods on her. The above class of Reclamation employees was conducted by Mrs. Mildred Rhoades, kneeling far right, of the Regional Safety Office. The following employees, shown above, received a certificate in First Aid Methods: Nadine C. Sanchez, center, kneeling; Lewis A. Skerry, Everett B. Velzy, Alan C. Doyle, Eugene Hinds, Armond D. Spendlove, George L. Baldwin; Howard E. Poland, U.S. Bureau of Mines Examiner.

CRSP Power Operations Office, Montrose, Colorado--Safety Committee:



SAFETY IS SERIOUS BUSINESS WITH US

Members of the CRSP Power Operations Office Safety Committee are shown above (left to right): Verne H. Hagenah, Personnel Officer; Irving W. Roberts, Jr., Chief, Power Dispatching and Operations Branch; James J. Dworak, III, Safety Officer; A. M. Gabiola, Chief, Plant and General Maintenance Branch, Montrose, Colorado; V. E. Larson, Project Construction Engineer, Page, Arizona; and F. D. Lord, Chief, Flaming Gorge Field Division, Dutch John, Utah.

During the month of September the Safety Officer for the CRSP Power Operations Office toured the following areas within the project and observed the following operations: Monarch Pass with the line crew cutting timber for access roads; Glen Canyon to observe Page line crew stringing conductor over energized line, also revising firefighting and emergency procedures at Glen Canyon Powerplant; set up fire training schedule for plant fire brigade; conducted lecture and showed film in conjunction with the Colorado State Patrol to forces at Montrose and Hayden line crews; investigated area of a vehicle accident; held fire training drill at Vernal Substation on the proper use of the nitrogen charged dry power units; showed film "Mechanized Death," and gave lecture on personal driving attitudes to the forces at Flaming Gorge Field Division; worked on rough draft concerning firefighting and emergency procedures at Flaming Gorge; investigated left embankment concerning possible slide areas; conducted fire training drill with the proper use of self-contained air mask and lifelines.

BUREAU SAFETY TRAINING--PROGRESS REPORT

Total number of employees who have completed Bureau safety training commitments since inception of these programs in 1965:

	N. S. C. Driver Improvement Training	Safety Training Course for Construction Supervisors and Inspectors	
		<u>30-hour course</u>	<u>One or more sessions</u>
Region 1	1,022	121	10
Region 2	1,458	109	334
Region 3	1,141	7	38
Region 4	1,065	129	95
Region 5	666	78	31
Region 6	606	49	43
Region 7	<u>1,204</u>	<u>190</u>	<u>0</u>
Totals	<u>7,162</u>	<u>683</u>	<u>551</u>

NATIONAL SAFETY COUNCIL DATA SHEETS

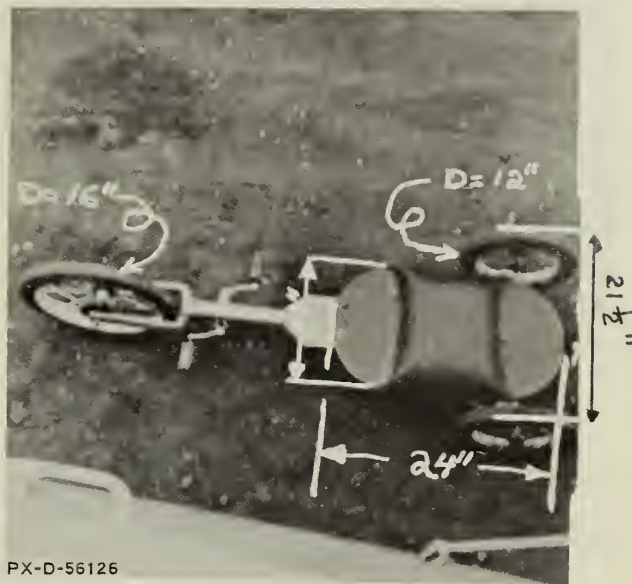
The National Safety Council has recently published revised or new technical data sheets on the subjects listed below. Copies of these data sheets (by numbers shown in parentheses) may be obtained from the National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

Electric Cords and Fittings (385)
 Portable Grinders (583)
 Metal Saws (Cold Working) (584)
 Management Policies on Occupational Safety (585)
 Tractor Operation and Anti-Roll Bars (587)

SUGGESTION SERVES BOTH EFFICIENCY AND SAFETY

Civil Engineer Donald C. Anderson and Construction Inspector Arlan W. Tift, Red Bluff CVP Construction Office, Red Bluff, California, designed an ingenious three-wheeled cart to facilitate the inspection of distribution system pipe. The self-propelled inspection mole, constructed of readily available materials, has resulted in substantial savings in the time required to inspect pipe in place. Further, it has eliminated the skinned hands and knees, bruised elbows, backaches, and torn clothing usually resulting from this work. The mole, involving a material investment of less than \$10, can negotiate 90° bends, reverse direction, and operate in 24-inch pipe. Those who have used the inspection mole to inspect over 7 miles of pipe are unanimous in the opinion that "it beats crawling through the pipe on your hands and knees."

The following pictures and drawings show how the inspection mole is constructed and used. Additional details can be obtained from the Regional Project Development Engineer, Region 2, Bureau of Reclamation, P.O. Box 15011, Sacramento, California 95813. (Re Reclamation Incentive Award No. R2-66S-86.)



SITTING POSITION



KNEELING POSITION

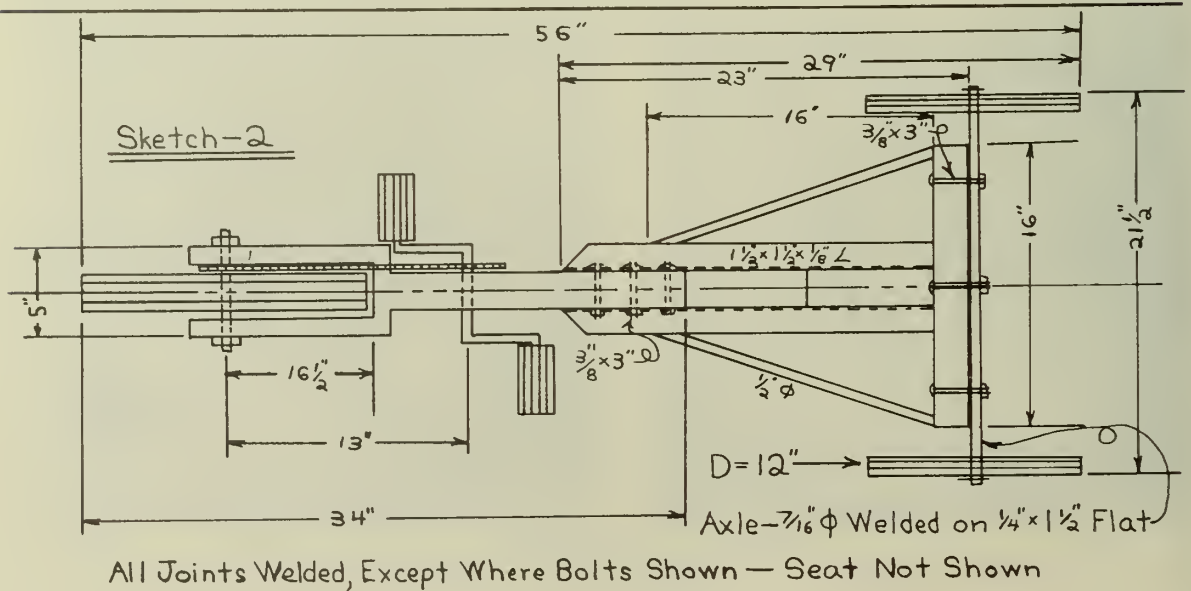
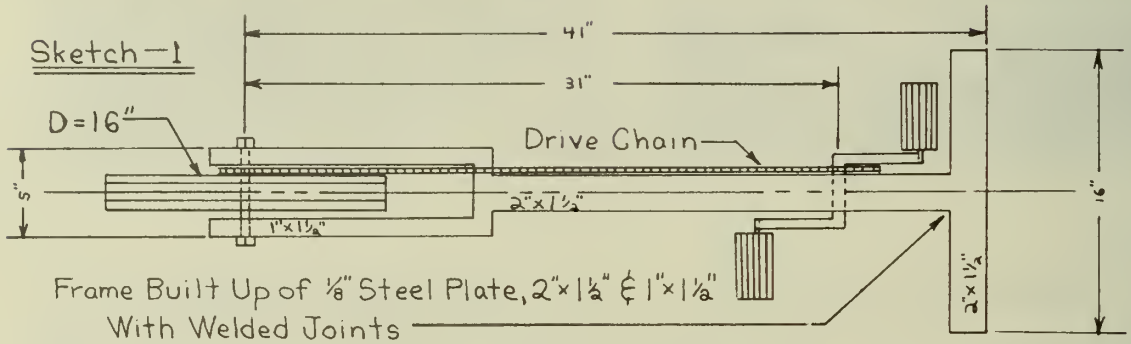


PRONE POSITION



PX-D-56124

KNEELING POSITION IN 42" PIPE



Remarks by Mr. Dale Marr, Vice President
International Union of Operating Engineers, San Francisco, California
at the Construction Engineers Conference, Bureau of Reclamation
Denver, Colorado, on January 25, 1966

Dale Marr is Vice President and Safety Director of Local 3, International Union of Operating Engineers, San Francisco. Mr. Marr is a member of the Executive Board of the National Safety Council, and is active in the Construction Section of the Council as well as in construction safety activities throughout the country. Since Local 3, with 32,000 members, is the largest union local in the world today, it is appropriate that they are aggressively promoting safety in the construction industry.



DALE MARR

SAFETY IN HEAVY EQUIPMENT OPERATION

Frankly I didn't come over here to give you any learned lecture on safety. I came over here to talk to you about the problem that is plaguing the construction industry and has been for a long time, with not very much being done about it. I don't have to tell you that for years if labor got mad at somebody or an employer, and we couldn't get him any other way, we would go out and raise a little hell about safety. Then we went back to sleep and didn't come alive until we got mad again. Now, I don't have to tell you fellows that for years management has said, and the law says, that safety is a management responsibility. We have no intention of usurping any of management's authority to manage their jobs. We want them to do exactly this--manage their jobs--but the law also says that labor has a right to demand a safe place of employment.

Fortunately, in the last few years, some of the more progressive leaders in labor have awakened to the fact that this is America, where we have many rights, and with rights go responsibility, and so labor started to say if we have this right we must also have some responsibility to help provide this safe place of employment. We have many problems when a

labor organization such as ours decides to go into safety, we have a problem just figuring out what avenues we can work in successfully without stepping on management's toes and this is a real serious problem.

Believe me, just going out and doing something for safety is not as simple as it sounds. Well, this is great. I had worked in supervision for a number of years when Local 3 announced in 1960 that we were going to start a safety program and the AGC sent out a read-and-destroy communique, "Watch out for Local 3, they're going to start a safety program and hit us in the head with a safety manual." Now frankly, if you hit me in the head for years and then come out and said, "Shake hands, we're going to be friends," I might shake hands but I'm sure as hell going to put the "Big Eye" on you. This is just what the employers did, and understandably so. My boss, Al Clem, who I just found out a few minutes ago is an old-time sparring partner of Mr. Bellport's, told us that "If you raise the cry of safety and you haven't got a safety problem, you're fired--just plain fired." In fact he found he had to go a little further. Nobody raised a safety problem in our jurisdiction but myself, and I went day and night to try to cover the bases. We didn't have a guy fired in 2 years that wasn't fired because he refused to violate a safety order. We went day and night running these guys down to take them out on the job--most of them didn't want to go out and talk to the boss. We finally got away from that, fortunately, so we're not out to hit anybody in the head but we're out to talk about mutual problems and there are many of them, believe me.

If we're going to stop this tremendous slaughter we've got to understand what the problems are and we've got to have help. Obviously the employer can't cope with it by himself. It's also obvious that the Government can't cope with this problem by itself, and needless to say, it is even more obvious that labor can't, and in some unfortunate cases won't, do anything about it. So I say we have a mutual problem.

Now, in 1959 in Local 3 we made a survey and we found that one out of every 12 of our members had suffered a lost-time injury the year before. Now this is a tremendous toll. Your health, welfare, and pension programs--and we have a fine one--are not worth a damn if the breadwinner of the family is lying there mangled up never to work again. We have to stop this slaughter.

Now, we decided, as I say, to go into a safety program and it's kind of interesting to me, as we get into this, that we find out that labor and management have many problems that are very similar. You fellows have all heard management say that a strong safety program must come from the top.

Likewise, the impetus for labor came from top labor. Hunter Wharton, our international general President, has been pushing real hard and so,

as in top management, our impetus came from the top. Our impetus in our local union also came from the top. Al Clem called the shots and told us what's going to happen, and he talks pretty blunt. He told us to go out and talk to the people in the field about what's happening. Now when you go out and talk to your members about what's happening to them, you can get into some pretty good hassles, I can tell you that, and some days we go out and raise hell with the boss. I can tell you that in all honesty we go out and talk to them first.

If we never see the State people, that's soon enough. We want to solve out problems on the job, if we can. Once in awhile we can't, more generally we can. Some days we have to go clear to the top but we usually get them solved and we've made friends doing this on a number of projects in a little while.

There are many people in top management who are glad to see us come around, but it doesn't do any good to go out and raise a big stink with management when the records show that in 1963, 47 percent of all accidents to the crane operators, shovel and dragline operators, blade operators, catskinners, and rubber-tired and roller operators was the simple act of getting on or off the piece of equipment. Now, the employer might help you off once in awhile, but he sure isn't going to help you on, and so, does it do any good to go out and talk to management about this? No, this is labor's problem and we are going to have to solve this problem, and also many other things. So we started our safety program, and as I told you, management was real leery and we knew this, and we had this reputation to live down.

When we started out we decided that our main effort would have to be in education. I don't have to tell you fellows that for years we kind of took a long chance. It's just as simple as that. I've operated shovels and draglines and when I think of some of the stunts that I pulled years ago (I'd take her as far as she'd go; I was so proud that maybe I'd take it a little further than some other people and I had some close escapes but I've lived to talk about it)--I kind of worry a little bit. Now, we've got a hell of a problem in how to tell the old timer that those days are done. We don't have to work that way any more, and so labor has a tremendous job of educating our own people of our own responsibility--we started out on that.

If we're going to do a real job in safety, there are a number of things that we have to have. First, and you fellows above all know this, we have to have safety in the planning for the jobs. Safety has to be an integral part of them, not something as an afterthought. This is true in too many instances--I don't have to tell you fellows that, you know it--that in too many instances, safety is kind of thrown in. If it doesn't really interfere with production, they're all for safety but if it does interfere, they forget about it, and you fellows have seen this. It has been prevalent

and I don't always blame the employer. We've had many instances where we've got some lead foot who wants to pass everybody, so we've got to talk to this guy.

It is management's responsibility to plan for safety and I don't have to tell you that some of this planning is a little limp, to say the least, or nonexistent. Fortunately those days are getting more and more behind us. This is also where I take my hat off to some of you Government agencies--you have done a real fine job of pushing labor and management to think about this and I hope that you will continue; in fact, I hope you brace up a little bit more. Some days both labor and management need a little push. Now another thing we need is the right equipment in the right place. I could cite you instance after instance and show you pictures of serious accidents with tremendous pieces of equipment because it was doing something that it really wasn't meant to do. On the cranes we have a tremendous number of accidents because they are overloaded far beyond their capacity. We've got one lift and there's a rig here so we'll get by, we'll hang some counterweight on the back, or we'll block it up, or something else. They've got twice as much boom in it as the manufacturer ever intended to have in it. Now counterweight is fine at times but you add more weight on the back end and you stick out more up front so you have taken the safety factor out of the machine. You fellows are engineers and know this much better than I; and yet, this has been prevalent over the years. So we've got to utilize good equipment in the right place, and we've got to be sure that everybody on the job knows what they're doing. Some of our people have made a good pass, doing exactly what they're supposed to do, and some other crafts working on the job and not understanding what our people are doing get in the way, and they get killed. It's just as simple as that.

In a few minutes I'll show you pictures of exactly what I'm talking about. So we've got to have the right equipment in the right place and we've got to have proper maintenance. I could talk for hours alone on maintenance--you fellows know this. Unfortunately, time after time equipment is reported as faulty and they try to get another mile out of it and something happens. I'm not even going to waste much time on it, but it's so simple that it causes lots of problems. Now this is another area where you fellows have done a tremendous job of pushing regular safety meetings. Labor and management have to convince the working man that we--and when I say "we" I mean labor and management--are interested in safety. We're talking about money, just plain old money, and when I go out and talk to employers I don't talk about safety, I talk about money. It's big money to the employer but it even means a lot more in money to our people. For example, in California, if a rubber-tired operator loses 2 weeks and draws the maximum disability, which is \$85 a week out there now, it is just \$276 that he isn't going to take home to his family. We are talking about money that the working man can ill afford to lose and we are real interested in money.

Now one of the real bugaboos in construction accidents, and labor is just as guilty as management, is what happens after an accident? Management, generally speaking, wants to cover up what really happened because they might get sued. This is a very real problem and I don't mince any words about it. I sympathize with them in many instances, especially if they can get a third party suit--they love these third party suits. So they are a little spooky and they have to be to survive. Likewise, labor is not a damn bit interested in a real thorough investigation because they might say that clown made a bad pass and killed somebody, and we've got to be honest. So, just think back to the last serious accident you saw on the job--think how quick it was cleared up with everything put out of sight. In many instances, neither labor nor management want to really bear down. For example, an airline pilot in the State of California a year ago had an annual rate of 76 cents per hundred-dollar payroll--76 cents! The annual rate for the guy that puts the baggage on the airplane was \$2.67, or something like that, it may have been \$2.70. Why? I need not tell you fellows that if the airplane cracks up it's usually fatal and there's a lot of man-hours charged, but they have a 76-cent annual rate. The guy that handles the baggage has \$2.70 because he's more careless, that's why, and because after an accident they hit him in the fanny with a band-aid or something else and he goes on down the road. However, when there's an airplane crash, it is thoroughly investigated, and I mean thoroughly investigated, so we have to have a thorough investigation and inspection of what happened. General Eisenhower, when he was General of the Army, was not popular with a lot of his line officers. Probably many of you served under him. He was a stickler for inspection and he had a saying that "That which is not inspected deteriorates." And so I say to you fellows, that if we are going to stop these accidents, first, we've got to find out what really happened. I will show you some pictures here in a minute and talk to you a little bit on some of the reports that go in on these accidents. They have no resemblance to what actually happened in the field. So I think in all honesty, and here again you fellows can help, that we've got to work on this to find out what happens.

One last thing I'd like to mention is that we also have to have good safety orders. Now I'm not a guy that feels we need more cops on the highways and more of this and that. I don't think we need a big, big book of safety orders but I do think that what we do have must be practical. They must be simple and they must be easily applied. Now when I say this, I'm talking about the need for knowledgeable people to revise safety orders. We need knowledgeable, broad-minded people from labor that are not in there with an axe to grind but are taking a cold-blooded look at the problem and we need interested management people.

In the State of California, we worked 2-1/2 years revising the Construction Section Safety Orders and there are some rather interesting

things in the new Safety Orders in California. On the 7th of August this year all rubber-tired equipment will be equipped with roll bars that will withstand three times the weight of the machine. They will all be equipped with fenders, seat belts, and a completely separate braking system. On the cranes there will be no excess counter-weight, no excess booms, and they will all be equipped with spirit levels for and aft. There are many things in those orders and we're talking about money, M-O-N-E-Y. Were the employers there? No, they had a couple of representatives, and now they are screaming like a mashed cat, "How the hell did that get in there?" It got in there because they didn't take enough interest to attend the meetings.

I was also a little bit ashamed of some of the people that were there representing the State. We were talking about equipment and some of them wouldn't know a piece of equipment from a sewing machine; yet, they're big authorities. When we were talking about equipment, we needed people in there that understood what was happening on the equipment. When we were talking about masonry work, we needed people that understood this. So I say to you fellows, when you have an opportunity, send knowledgeable people that can help promulgate these orders because if they're not practical and if they're not easily applied and universally applied, they're not worth a damn. It doesn't do labor any good to get something in the orders that's going to hit somebody in the head if it's not practical. It will hurt the whole industry and if it hurts the industry, it hurts us, for, whether you like it or not, we're part of the industry.

I want to say just a couple of words here regarding environmental health. The next big gain which labor will make is going to be in environmental health. I'll tell you that flat, and just remember what I told you. Four or five years ago I started talking about air-conditioning equipment, and my boss, Clem, said, "Marr, I'm going to run you off the job if you don't quit talking like this. You must be gone zany or something." Well, I didn't go zany. Down on one of the canal jobs today--some of you fellows may be from down there--Peter Kiewit has some big rubber-tired rigs that are air-conditioned. It cost him \$800 on a \$165,000 piece of equipment to air-condition, and do you know what Bob Nemo told me in Chicago in October? He said, "Marr, those production records look real good on that." So, there are many things. There isn't a legal piece of equipment in the State of California as far as noise--not one piece of construction equipment that is legal. It just isn't there, and if you wanted to institute millions of dollars worth of claims, the Department of Public Health would back you up, it's just that simple. There are things happening to our people from excess heat that we know very little about. We're going to find out a lot more. Some of you fellows were down there on San Luis when we ran some studies and there are going to be some more. There are a lot of problems. Prejob physicals--I hope you guys keep pushing it because we have got to get going on that. Labor and management have been smart on this issue for years and if you guys push us hard enough we'll sit down and talk about that.

Now just a few highlights. As I said, I didn't come here to give you a big lecture. I came here to talk to you about what's happening in the industry. Now you might say, "Marr, you're full of baloney." But I've got some pictures here and you'll have a hell of a time arguing with me about them because they are what's happening out in the field. Now I want to show you some things that are happening in our industry, in our jurisdiction, and there are a number of reasons for it. We had a job up in Feather River Canyon, see Figure 1, which was a little narrow, sliver cut and a little sliver fill. For the want of one thin dime, one of my long-time friends, in fact, I broke him in when I was working in supervision, died, and unfortunately, not instantly--he lived for 18 months, a human vegetable. It was a little narrow cut, a little narrow fill, and it was about even. With these old C-pulls the operator is blind on the right, you fellows know this, and he was running blind across the main line track. Now this old blade operator asked the superintendent, whom he had known for years, "Why don't we reverse this and cross that track in the opposite direction so that the operator has good vision on the side where the track makes a right turn, the other side is straight track with good distance view." The boss said, "You run your blade and I'll run the job"--a little hard-nosed, you see. The old blade operator said, "The day that flagman goes to sleep one of our men is going to get killed." He did, and they said he was lucky that there was a doctor and a nurse on the train when he was hit. They jumped off their car and saved his life at the moment but he lived 18 months, a human vegetable, and then laid down and died. This happened because the boss resented somebody making a suggestion.



Figure 1--A train hit the C-pull on the blind side.

He's sick about it now, I tell you that in all honesty. The blade operator said, "I wished anything in the world I'd have given you a call, Marr. You could have talked to him where I couldn't." So, if you fellows see something--and you see a lot of things--that maybe don't directly involve you, ask a question; it might save a life or a number of lives.

Here's an instance, see Figure 2, where one of my long-time personal friends--in fact, he was going to college to study in Safety--and four other experienced men went over to dismantle a whirley. They knew exactly what logical steps to follow in dismantling a whirley, as they had dismantled many of them. Hawaiian Harry was one of the most famous riggers in the Bay area. He had a crew of five men out there. One derrick barge was a little bit slow getting there so they said, "Oh well, we have no problems, forget the procedure, we'll pull the center pin." Now if you fellows are familiar with these big rigs, you know they have a center pin that's bolted down which stabilizes the thing. So they pulled the center pin and lashed it along side of the motor. The other crane got there and they hooked onto the boom and pulled the top and lift line off. Then they hooked on with the second boom right at the base of the boom to pull the boom pin, and this is how my friend got killed. They need a house brake off, so he gets off his rig, leaves it hooked onto the base of the boom, foolishly, with a little strain, and then he goes up and kicks the house brake off. A tug came up through the estuary and threw up a wave. You know what happened. It raised up, the crane slid off backwards and killed five men. Why? Because they got careless. Now did it do any good to go out and raise heck with the boss? No. Our men committed suicide, you might as well say, unfortunately.

Figure 3 shows a new piece of equipment--which will fool you. This is a great rig. It is a mobile tower crane. You're going to see a lot of them around. They are a great piece of equipment, but like everything new, they have little idiosyncracies. If you handle them wrong, they're going to kill you. Now this thing is designed to work with all wheels off the ground. As you can see, there's an inch and a half clearance. It is designed to work on the outrigger. If you work it with the weight on the wheels it is going to tip over on you. Just as sure as I'm standing here, it's going to tip over. So this is something that you should know about. A little excess counterweight, but this is a great piece of equipment. When you take the tower off and put a regular boom on, you've got a real nice truck crane. However, with this on it you don't run it up and down the road like you do a truck crane, and we've had a heck of a time right in San Francisco with the superintendent on the job because he just couldn't get it through his head that this thing couldn't run up and down the road and up and down grades. Now when they almost turned it over, by a miracle they didn't, I think he got it through his head.



Figure 2--A crane slid off a barge because somebody was careless.

Figure 4 shows a very interesting job. This was taken in the Fox Plaza right downtown in San Francisco on Market Street. It shows you that communications are real important. They're going to jack the stiffleg guy on the last lift up, the mast sets on a 12-inch block. The same crew has raised the rig many, many times and is familiar with the procedures. The operating engineer is in the basement 10 or 12 stories down receiving instructions by telephone from the signalman. The signalman tells him to raise 2 inches. Now what they don't realize is that somebody in haste had picked up a 14-inch block, nobody even knows where it came from but now they're trying to set this mast on a 14-inch block, and it won't go. They are shy 2 inches. So the signalman calls down and says, "We've got to have 2 inches." The operator says, "Tell the boss to look around, something's wrong." The boss has had a bad day, and he's mad. He's a little hot because nothing is fitting, and he says, "You tell that rotten old so-and-so that I'll run the job, and tell him to run the hoist." So the signalman relays the information to the operator to tend to his own business and that the boss is capable of giving instructions. The boss, who is cussing to himself, says, "We got to get up." The signalman says, "Did you say up?" The old operator, who is down below boiling, hears the word, "Up," and he says, "If they want up they'll get up"-- and they did. He got up on this big hoist, and everything came down. They dropped steel--hell, there were pieces flying all over the place, dropped in 15 or 20 men, and never killed a man. It just wasn't their time to go. Communications. I could talk for an hour on that.



Figure 3--A mobile tower crane cannot be run like a truck crane.

I talked to you about excess counterweight a few minutes ago. Now they tell me this isn't excess counterweight, see Figure 5. They said those are compressors. I said, "Well, I thought they were making a little noise back there," but if that isn't counterweight, I don't know what else you could call it. Now I'm talking about a good employer. He has turned this thing over twice, and he wants to know what's the matter. This thing is so badly out of balance that if you move it, and it's the least bit out of kilter, over she goes, and he couldn't understand why. This is a real rig. Those Manitowoc's are real good pieces of equipment, one of the best in my honest opinion, but it's no good this way. Why? Because they are doing something with it that it wasn't designed to do.

Here is an instance where the operator can't quite reach what he wants, see Figure 6. He's 6 feet short, so the boss says "Get that rig out there." The boss is a real nice kid. He's the son of the Project Manager, and he's working his way through college. But he's now boss, so he says, "Get that rig over a little closer to the bank," and the operator says,

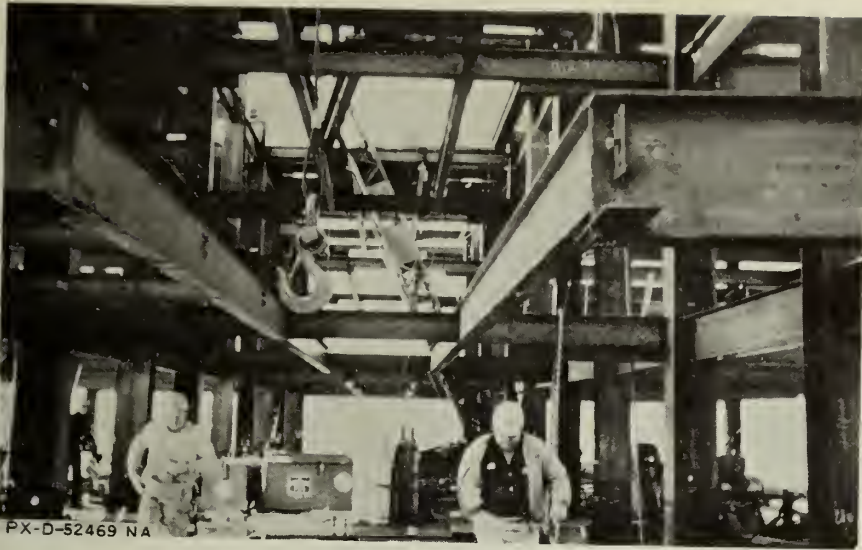


Figure 4--Jacking a stiffleg derrick mast too far can lead to disaster.



Figure 5--Compressors on a crane can become excess counterweight.

"Son, this rig wasn't designed to set on these banks." Well, the kid knew better. He thought the operator was being a little hard-headed so he says, "Im' running this job, I'm just telling you to get over." The operator says, "Okay son, I'll put her as far as she'll go, and when she quits going I'll get off." He did, and he isn't moving much dirt with this thing now. This is just an instance of somebody issuing orders



Figure 6--Embankments cave when equipment is too near the edge.

who didn't really know what the equipment would or could do. So I say to you fellows in all sincerity, if you see people on the job trying to do something that doesn't look right, ask them questions, because, unfortunately maybe the boss doesn't know, and even more unfortunately, maybe the operator thinks the boss knows and it's damn sure the operator doesn't--so we have a problem.

Figure 7 shows a \$15-million job. They built a catwalk out there and they've got a very legal guardrail on it. However, when they get out there where the work is to service this thing, there is nothing--no protection whatsoever. They got tired of putting up rail and so, of course, it's only an 80-foot fall into rock; there's nothing there to protect the workman when he gets where the work is. Now this is ridiculous, isn't it? So a workman just got tired of putting it up, and the boss says, "Aw, it's all right," so everybody let it go. Now here's where we're both wrong, and we need a little jacking up.

This piece of equipment, Figure 8, is very popular. Now you wouldn't think an operating engineer would be stupid enough to stick his arm out here, or in a couple of cases his head, and let the bucket down and cut something off, would you? But it happened, and we had a tremendous problem. It was a big problem. We talked to the people that made these machines and they were having a hard time coming up with something. One day an old greasy-handed mechanic says, "Well, if I'd known that's what your problem was, I could have fixed it a long time ago." You see that screen? Isn't that simple? In fact, it's so simple that it's almost disgusting and yet some days it's the little things that count. So I say to you fellows, look around and see how many safety features can be accomplished by simple things.



Figure 7--A guardrail is even more important at a working point than on a catwalk leading there.



Figure 8--A guard screen between hydraulic cylinder and operating arm can prevent accidents.

Once in awhile the boss knows what he's doing--just once in awhile the boss is right. Here's an instance involving a garbage dump, see Figure 9. This, incidentally, was a very expensive, brand new unit, about \$20,000 worth. There was a young kid going to take his gal to the wrestling matches and he was a little late. The boss said, "You can't go down this road. We've closed it because we just lit the fires and it's too hot." The kid thinks about this. He's on the payroll and he's getting paid to drive this truck, so he decides instead of going around, which would take 20 minutes, he'll take a short cut. He thinks it can't be that hot down there. The picture shows it was real hot, and fortunately, a couple of guys saw him going. They knew it was hot down there and they grabbed some fire suits and pulled the kid out. But he was 8 or 9 months in the hospital with his lungs horribly burned and will probably never work again in his life. All because he thought he knew more than the boss. So we tell our people, "The day you get to thinking you know more than the boss, maybe you better get out in a dark corner and take a little look at yourself, because the boss might just be right."

Figure 10 is one of my classic pictures. The old boy who was driving this rig has fired more foremen, run more mechanics down the road, and raised more hell with State agency people for parking their rigs in the way of the work, than anybody I know of. But he had this little Falcon, brand new, and boy, he was proud of it. One day he drove out on the job and saw something that really burned him up. He jumped out of his rig to wave his arms and he heard a noise behind him--now here's his rig. About that time old Marr shows up and he said, "Marr, if you show that picture I'll whip you, big as you are." I don't want to tell you his name, but many of you here know this guy. He's famous in the construction industry and I wouldn't take a thousand dollars for this picture. I tell him that anytime I hear he's getting cocky, I'm coming out and show this to his crew. I don't care how much you are interested in safety--this old boy is real interested in it because he works hard at it--but you just think about something else for a few minutes and this can happen to you and quick.

Figure 11 shows an unfortunate thing. The operator was a longtime friend of mine. He and I ran shovels together 20 years ago. He had a young boy, so the "old operator" here is going to show him how to start a Murphy diesel. The kid had heard about Murphy diesels but he didn't know anything about them, so the operator knows better than to have the kid on the rig. He's only going to make one lift, so he gets the kid back there, shows him how to start the Murphy and he says, "You stand here and watch that governor. That governor is what's made Northwest." He's only going to make one lift so he doesn't set the diggin' dog that locks the track. He starts booming up because the boom is right over what he's going to pick up, and when he gets up he starts picking up the load. He was on a little downhill slant and as you can see, it wasn't much, but the rig rolled ahead 6 feet and turned over on its side. The



Figure 9--A shortcut through a fire is the long way 'round.



Figure 10--Stopping a car on a haul road is equivalent to throwing it away.



Figure 11--Careless acts can trigger a series of mishaps, one caused by another.

kid lost his balance and fell in head first under the motor with his arms folded and couldn't move. Now somebody had left the cap screws out of the plates that hold the punchings down on the counterweight, so the punchings rolled out and covered the kid. Somebody had also left the cap off the diesel tank and the diesel fuel ran out and smothered the kid. It also ran down on old Tiny, the operator, who had his head caught in here in a hard hat--I wish I had the hard hat, you wouldn't believe that a man could live in it. They couldn't get Tiny out, so a guy rushed out with a torch, lit it, and was going to burn the thing out. Old Tiny said, "Turn that fire out--you're going to burn me up!" The guy got excited. How many times have you fellows seen an accident that has happened where somebody gets excited and causes something worse to happen? When an accident happens, that is the time to cinch down.

Now here's an interesting job, see Figure 12. The superintendent says, "You don't think for one damned minute that I'd use that thing for a working platform do you?" He has a hell of a time explaining that picture. He had a real fine safety record and there they are up there. Now this isn't a very stable working platform and he was real embarrassed, so we told him, "Let's quit kidding each other and work on the problem." These things happen and that camera tells some embarrassing stories.

An operator ran a rig for 27 years and then 1 day a guy hollered at him and he sticks his head through to look out the other side of the rig and

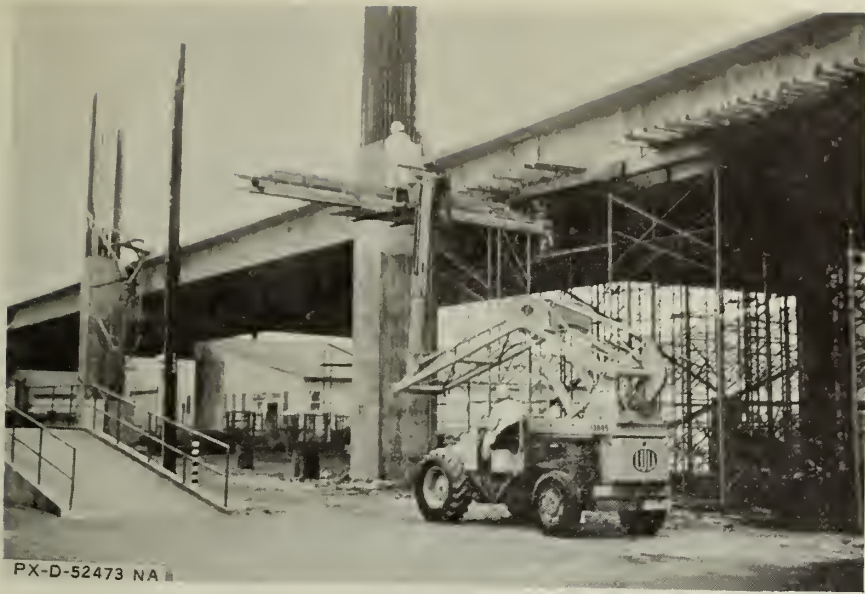


Figure 12--Far from a safe working platform.

cut his own head off. I could show you some pictures of this but I don't think you would really want to see one. But familiarity breeds contempt, fellows, you know this. Just get used to doing something, it's humdrum, you're thinking about going 'fishin' or thinking about something else, and these rigs will bite you and quick. Does it do any good to talk to the boss? No, this is a 27-year employee and the boss is in the hospital overcome with grief.

Does that dust in Figure 13 look familiar to any of you? If it does, you're too old. We aren't going to work in dust any more, I can tell you that. We have some environmental health studies that say we aren't going to do this any longer. So if you see a situation like this, you better talk to the employer about it because we aren't going to go for it.

In another situation, they had a rig ready to move. There should have been some 2x4 hardwood planks on the loading ramp, but they got in a hurry to move the rig. It was raining when they went out and moved it, and for the want of a little something for those rubber tires to get on, the rig slipped and turned over. They were in a hurry but they had to have it, and so with it raining they got up on this thing and over she went. Fortunately the operator wasn't too seriously injured but this cost the employer a lot of money, and you know it cost our people money too, because there was nothing for this operator to work on for a few days. So we are interested in money also, and this type of thing hurts our people, and we don't like it. Just carelessness, that's all. The rig boss was a longtime friend of mine, incidentally, and was personally moving this rig. He and I worked in supervision together for a number

of years. It was so wet that the operator said, "John, I don't think it's going to go." And John said, "Aw, it's solid as a rock." But it wasn't very solid--they didn't make it.



Figure 13--Dust in the operator's lungs is more costly than dust in the engine.

In Figure 14 are some rigs that may look familiar to some of you fellows from San Luis. These rigs came out and the noise was unbelievable--clear out of the ball park. They said they couldn't do much about it. We contacted the company, they flew some engineers in from Texas, and by simply changing their exhaust system, it cut those decibels down to a tolerable limit. They say you can't do much about noise, but you can do a lot of things about noise if you so desire. I say there isn't one legal piece of construction equipment in the State of California under the new safety orders. Now these are engineering problems. I could raise a lot of hell tomorrow if I wanted to but I don't want to. Local 3 doesn't want to go this route and we are telling our employers you better talk to the manufacturers. We had a problem in the industry prior to a couple of weeks ago when we went out and hollered about noise. Our people had to wear ear plugs. The California Department of Public Health has taken a hard-nose stand and will not go for ear plugs on a construction job because of personal hygiene unless there is a real refinement in the way they handle it. We are going to be talking to them about noise.

This is an unfortunate thing, see Figure 15. How many times have you fellows seen them working under a piledriver hammer? The law says you chock them up but how often do you see them hanging on the brake. Here is a guy's hard hat. That's about all that's left of two men because they got careless one morning. They were having



Figure 14--Noise can be reduced to tolerable levels.

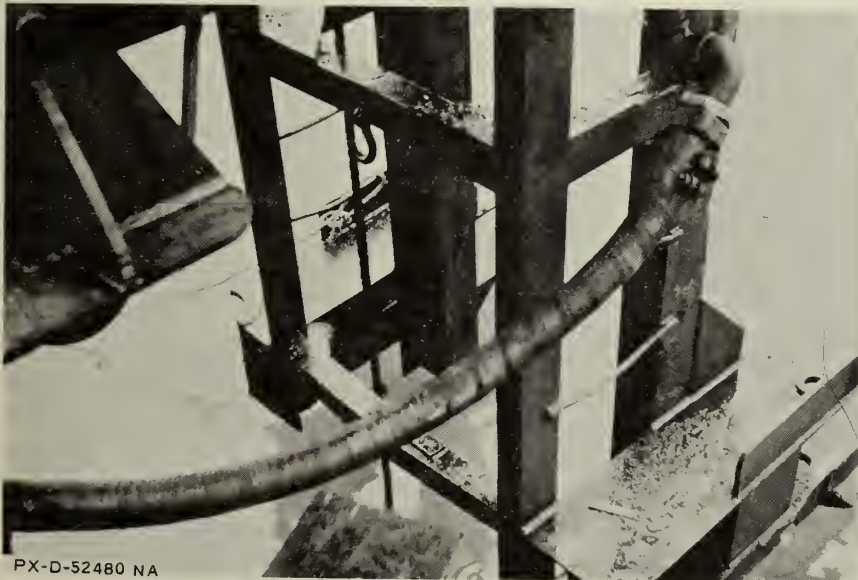


Figure 15--Piledrivers are only safe when the hammer is chocked.

trouble with the dog on the driver, so the boss did some welding on the dog. Now it's all right, so they're changing the cap. The damn thing came down and cut two men up. I'm not going to show you those pictures--I've shown them around some and people got sick. Needless to say, two men paid with their lives for a moment of carelessness. We all know better, but they took a chance. Management admitted that they were somewhat at fault, but I say our own people need to do a little soul-searching, even though the law may say that management was responsible.

I could talk for an hour on these tower cranes shown in Figure 16. They are a wonderful piece of equipment and they have some real application. If you fellows are familiar with these cranes, you know that this counterweight sets out back here and when they're going to jack it up another floor or two they have to go out to the counterweight. Since there's nothing to walk on, they hang onto these little beams and slide out there. Now some of the employers were a little excited because I said we've got to have catwalks, and some of the manufacturers of the cranes also hollered and screamed. After a number of these cranes fell apart, we had a study made of the steel and they told us that the steel was no good. If you had four cranes it would take five welders working day and night to keep the cracks welded up in them. We in America went to sleep and let an inferior product come into this country. I believe the whole construction industry is remiss for not insisting on some safety standards and control of material. One of the major manufacturers guaranteed us some controls on the materials and then the crane fell down the other day, so it makes you wonder who's kidding who. The figure shows the way they have to walk out there on the cable. If he misses he's all done.

Figure 17 will look familiar to some of you men from San Luis. We went down there and asked them about this. They've got a long belt line and we asked, "If something gives way, how do you stop that belt?" They replied, "Oh, it's automatic." It was automatic all right, but the thing got away twice and there was so much rock that you'd have thought there was a war on. Fortunately nobody was killed. We then found that the design was no good and we had a real problem over this but they've got it whipped now. It was an engineering problem. That is why I say when we go into this sort of thing, it takes engineering, and I'm not going to do any engineering. I found out one time down at Comanche Dam that you can't keep umbrellas on the rubber-tired rigs to protect the guys from sun. I was in a big argument 1 day and I said, "How smart would you have to be to take some of that pipe"--there was a big pile of pipe lying there--"bend two pieces of it, drill a hole in each corner, and bolt on some plywood with four little stove bolts?" Two years later that plywood is still up there, it was terrific. The boss said, "Gosh, you really saved me some money!" Then I went out there with my sound instrument and made a little survey. I found that rig with the sounding board was 20 decibels noisier than the ones without it. The boss was madder than hell at me, so then I said, "Marr has



Figure 16--A walkway should lead to the counterweight.



Figure 17--Safe equipment is designed. A belt conveyor needed redesign to prevent runaways.

done his last engineering because Marr is not an engineer, and there won't be anymore of this sort of thing."

When you see things like this, you wonder who is doing the engineering on that. Fortunately no one was killed; we have a lot of fortunate accidents where no one is killed, but you shudder to think what could have happened.

Now, in Figure 18, some of these fellows that are setting up a little higher are setting on boxes of powder; and so, when the company that's doing this job--and they are doing a hundred-million jobs--brag about their great safety program, I go up and show them that picture.

Here's a situation coming down a real steep hill, see Figure 19, no fenders. They had fenders on this but they took them off--no protection, dirt boiling over with an occasional rock. A 150-pound rock rolled off this, hit a tire, bounced up in the air, and hit the Project Manager's boy in the head. He ran half a mile down the hill in a slot and when he came to the bend the rig jumped the berm and down went the can and wiped it right out. Three men were injured and one was killed on this job before they got the thing taken care of. I was out of town. Ridiculous, isn't it? That's why we say we want some fenders on these rigs, for we've got too many instances of men being injured or killed with rock flying off the tires, on extreme grades.



Figure 18--Blasting powder isn't a safe seat in a truck.



Figure 19--It's easier to be struck by flying stones when there are no fenders.

Figure 20 shows a real interesting situation and we raised some engineering problems. There was a 90-ton rig and a 140-ton truck crane, both in excellent shape. They've got an 85-ton lift to get a boom up there to the top, and they got it within 2 feet of where they were going to set it, and down she came. It totally wiped out the 140-ton rig but it didn't kill anybody. There was a crew of riggers hanging all over that thing. They are building a crane here to load these big boxes that they send overseas. That's how they load the ships nowadays, as you well know, and so they're building a big rig. Now what happened? We are having a hell of a time with boom after boom of T-1 steel. Now I am not as such condemning T-1 steel, but I am saying this flatly, that we are having accident after accident, why? We find a section of a boom that they put a nick in by just binding them down too tight, or transporting them. You put a little nick in this and they're gone. Now they're terrific if they're used properly and if properly maintained, but if there is one mark on it, you'd better get it off the job or somebody is going to be injured or killed. So, here's a 140-ton rig wiped out. Fortunately, no one was killed but the owner of the outfit is real spooked. So we say, "We want an engineering study of this because we've got to know more about it." Two real nice pieces of equipment were torn up, and why? We don't know why, but we hope the engineers can tell us.

Figure 21 shows another piece of equipment. They've spent a fortune designing this rig and hydraulic hammer and it runs at 120 blows a minute. As you fellows know, with the old steam hammer you're doing pretty good if you get 60. It also has an auger on the side and is hydraulic,



Figure 20--Close inspection of T-1 steel might prevent collapse.



Figure 21--Faulty design? Structural failure? Vibration? Something wrecked a hydraulic pipe driver.

so the thing is terrific. It takes twice as many pile butts to keep this rig working. The coffee truck came by and honked the horn and if you want coffee you better get out there because this guy's got a few bucks and he's a little independent--he isn't going to wait for you. So they blew the horn and everybody ran for the coffee truck. Fortunately they ran, and the guy running this rig just hit the ground when this thing came over. Why did it come over? This is an expensive piece of equipment but when it is running 120 blows a minute, it is vibrating at an unbelievable rate. So we wondered if steel fatigue had anything to do with it? What causes this to happen? We don't know yet. We're not trying to hit our employers in the head because they're sick about it too. These are industry problems, fellows, and you fellows better take an interest in this thing yourself? You can see how this steel was twisted up and how fortunate that operator was. He just hit the ground. Thank God he drank coffee.

Once on a storm damage job, I crawled up 200 feet of hill and asked an operator what he was doing. He didn't really know what he was doing. I said, "What did the boss tell you?" He said, "He told me we got to get this done somehow." The boss was standing down the road so I called him up there, and this is once I had a big advantage on him because he was now out of breath and I'd regained mine, and I said, "What do you want us to do next--we've just quit doing this." So he tells me, "Hell, I didn't tell him what to do, I just told him what we had and left him figure it out." And I said, "No, he's getting paid to run the cat; you're getting paid to run the job. We just quit doing two jobs and we're going to do only one, so you tell us what we're going to do and how we're going to do it safely." He was madder than hell at me, and the State wasn't too happy with me because ultimately they had to put out an extra order to go up the hill another 200 feet and do it right. So, all too often we go out on the job and say, "Now what are you doing?" They don't know, but they're trying something, and those days of trying things are all done, as far as I'm concerned.

Now you talk about dust and stupid operation. This guy here, see Figure 22, is roaming around like he's lost. At times, when the smoke comes his way, he can't see his hand in front of his face, so he runs forward until he hits the bin and then he turns his bucket over. It's ridiculous, and there's no rhyme or reason to it at all. The thing is belching smoke from all directions and they are a little reluctant to do anything about it.

Then there's the guy who goes out to drive piles, so the boss says, "Have you ever driven any?" "Oh yes, I've driven a lot of piles." Now this guy was a pretty fair dragline operator but I guess he had never run this type of rig. So he tried to turn, he was setting a little downhill anyway, and you guys familiar with those old Northwest's know a house brake never held on one of them ever. He swung down, cut downhill, and the swinging 6-ton hammer at the top knocked him over. I don't know how he got out of that thing alive, see Figure 23; it was lying right on top of him and was mashed down until it looked like it was about a foot thick. We dug a



Figure 22--Blinding smoke and heavy equipment in motion spell danger.



Figure 23--An operator who is unfamiliar with equipment may never even start the job.

hole and pulled him out from underneath. Here was a case where a guy simply got into something that he didn't know anything about. So we have a hell of a job of training people, and we know it. Let us know about any help you can give us because we're all ears.

There was an old boy who was the oldest member of the Operating Engineers in California. Three months before this accident happened I was out on a job and he had a 3900 Manitowoc driving piling on two sets of mats because the underpinning was so bad that it was standing right on its nose. I said, "Andy, we don't have to work this way any more," and he said, "Well, son (I've got gray hair but he calls me son), go on down the road and talk to the people you can help. I've forgot all there is to know about a rig." Three months later he's out at the Antioch Steam Plant on an 80 Northwest, see Figure 24, with a 3/4-yard clam that's over there in the background. He was fooling around digging a 3-1/2-foot trench in sand and boomed up pretty straight. So he hooked the cable and the rig started up and he casually bumped at the closing line and he missed it. Then he went to bump again, and it was too late. The rig came over. Now I want to say one thing. The first time it dropped, Andy was alive. They had a big crane setting right next there which doesn't show, but they grabbed the chocker and threw it right around the crane and picked it up. The sling was about half big enough and they got it up where they could almost pull Andy out when the sling broke and he was damn sure dead the second time. Now I mentioned a minute ago about doing things in a hurry after an accident-- this is one. Now maybe he would have died anyway, this is only conjecture and we don't know, but we know he was dead the second time. So take a cold-blooded look at what you're going to do. This was a fortunate day in many ways. If that boom had fallen 6 feet to the right, it would have fallen where they were wiring 50,000-kv hot and would have electrocuted eight men. It just wasn't their time to go. Some days one guy is lucky and the next guy isn't. Well there's a lot of luck in this business.

Here's a roller operator who was one of the best crane operators in the country so he signed the out-of-work list so that he could be put on anything in the book. A job came along to roll hot stuff and they said, "Al, you're not a roller man," but it's his privilege to put it down there and we can use no judgment in dispatching men because of the Taft-Hartley Law--you fellows know this. Now, I'm not crying about the Taft-Hartley Law, but I am just stating as a matter of fact that we can't tell Al Hanson that he can't go out on that roller. So he worked for 1 hour and ran the thing off the road, see Figure 25, because he couldn't steer a roller, mind you, and killed himself. Stupidity, that's all. So there is no use going out and talking to the boss about why Al Hanson killed himself. He did it to himself. He insisted on going out, as I say one of the top men in the country on cranes, but he couldn't run a roller. They are pretty simple but they are pretty tricky.

In another case a rig had a bad tire on it and the business agent who happened to be on the job asked the boss about it. The boss said, "I'm



Figure 24--After an accident, it's often better to do nothing than to do the wrong thing in haste.

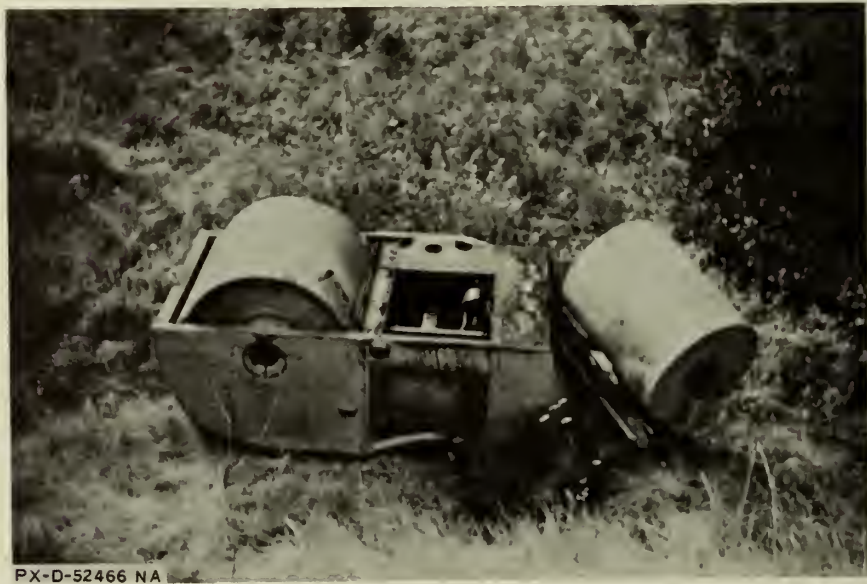


Figure 25--A good crane operator may make a poor roller operator.

just finishing the job. I admit the rubber is rotten but if I can get two more days I can finish." Well, he didn't quite make it. He got another day and a tire blew out and turned the rig over. It tore the man all up, but fortunately, it didn't kill him. For why? For trying to squeeze the last ounce out of a piece of rubber. Now many accidents happen when we're trying to finish a shift or trying to finish a day or a job with equipment that's not really in condition to produce anything. We're just trying to get by, and as I say, we're guilty, too.

A young kid was going to Humboldt State College up in Eureka and working in the summer to get enough money to go to college. They put him on a real tough job picking roots. Now this redwood is heavy when it's waterlogged and this kid picked up a log that I would guess weighed about 150 pounds. When he picked it up and threw it on his shoulder, he knocked his hard hat off. Well, this made him a little hot, so he laid the log down, put his hard hat back on and picked the log up again. There was a little limb lying there so he reached down to pick that up and knocked his hard hat off again. Well, now he's a little hot. Then a guy rolled down past him with a 657 rig coasting and pulled back the throttle. The kid liked to jumped over the cab and now he's really mad. Boy, he jammed his hard hat on, headed off across the country, and that guy there came damned near running over him. The boss had given me a half hour to hold a safety meeting on the job. They've got about 80 engineers on this end of the project, and while we're standing there, the boss ordered them to park. So they were all in a hurry to park and they got to horsing around and nearly killed a big husky young kid. They were just goofing around for no reason in the world. We had a safety meeting, I can tell you that, and they understood what I was talking about.

I talked to the boss about the condition shown in Figure 26, and he said, "If anybody is foolish enough to get caught in that, to hell with him, I couldn't care less." Well, we had a few words. You had to walk within a foot and a half of these belts to turn off the master switch to the plant. I asked the boss about it, and he told me off. So I got a little hot at him; in fact, I ended up telling him it was a shame he was allowed to wear a Local 3 button. He said the State had okayed the operation. Well, this burned me up and I called the State guy up and raised hell with him and cranked him up a little. He came up the next morning and shut the plant down with 30 rented trucks sitting there. This made the owner of the outfit so mad that he fired the kid.

Last year down at our training camp at Camp Roberts, a little guy came up and said, "How are you?" I said, "Fine," and he said, "Do you remember me?" I said, "Unfortunately, I'm afraid I don't," and he said, "Well, I got a real good chewing from you and fired from the best job I ever had in my life." I thought a lot about that and I said, "I don't remember where this was, and I can't imagine me getting mad."

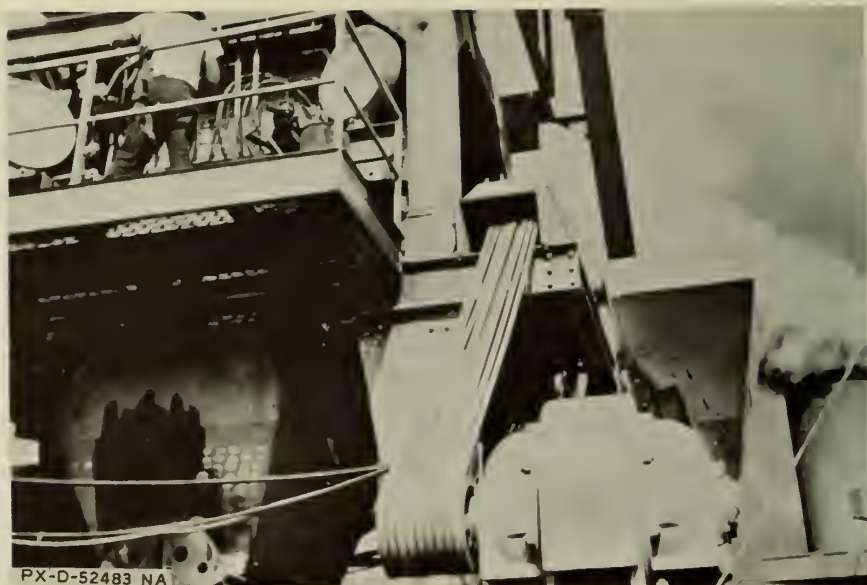


Figure 26--Belt guards are vital.

He said, "Well, you seemed to be pretty hot that day and it was up at Crescent City." I said, "Oh yes," and he said, "Frankly, I have been kind of grateful to you since then, and I have taken another look at this." Now, this was a smart kid. He thought he was making the boss a lot of money working like that, but hell, one accident would wipe out more than the boss could make on 10 jobs, so he wasn't helping the boss. I tried to tell him that the boss doesn't want this because I've known him for years and he doesn't work this way. Well, some days our people think they are making the boss money.

A longtime personal friend of mine and his oiler were killed in the 180-D shovel shown in Figure 27. Now what were they doing? Ninety tons of powder had been loaded, some of it for 3 weeks, on this job. Lightning occurred every day, and on this particular day the drillers quit at 1 o'clock because the lightning was flashing all around. They called and asked, "What about the engineers?" and the boss said, "Oh, don't worry about it, our men keep on working." Why? I don't know why, they know better than that. An hour later the thing went off and killed three of our people. There was not a better shovel runner in the country than Andy, but he was careless. I've talked to Andy many times but he couldn't "read" me. He was still working in the "Dark Ages" when you took the long chance. So the fact that the face was loaded with 90 tons of powder didn't worry Andy a bit, and I'm sure he isn't worried much now.

I went up there the next morning, thinking the job was shut down, and there were 85 men working on the face. I said, "What the hell are they doing now? That face is still loaded--there were only

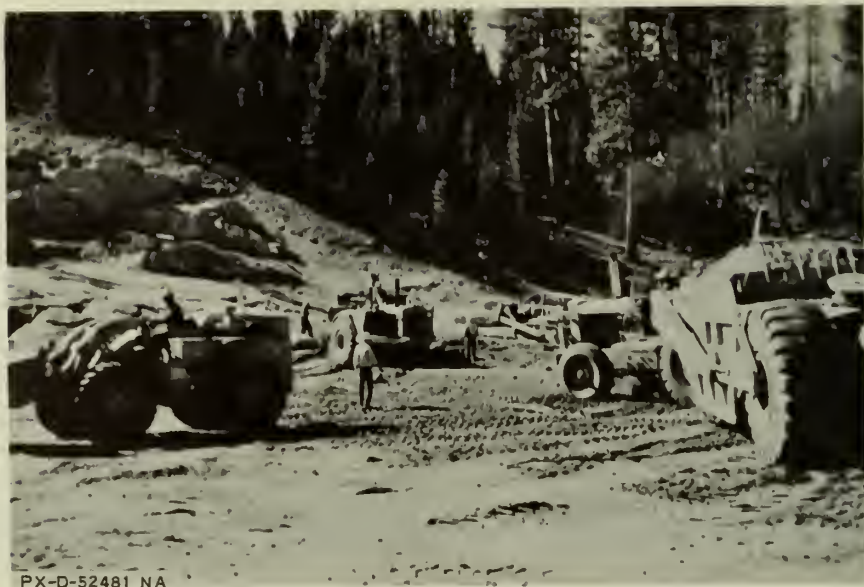


Figure 27--Lightning storms and loaded powder holes mean trouble.

three holes went off and the rest is still loaded." It was thundering right then and they had their men back working. Well, it was shut down real quick. And so I say, if I ever saw criminal negligence on the part of an employer, I saw it there, but I also see three men that all knew better than to be working there. So I want to see the day the boss tells me to keep working while looking down the barrel of a gun and I'm going to throw a lot of fanny in his face--and I've got a lot of it I can throw there. Sure this is wrong and our people know it's wrong.

We talked a minute ago about maintenance. On one job there was a brand new, real nice little rig and they forgot to tighten a bolt. Late one evening, it was dark when I got there, they picked up a clam half full of dirt and the thing just fell off backwards--no maintenance. They admitted they never even thought to look at the thing--they'd never had one fall off before. Fortunately, all it did was shake up the operator and goof up a pretty good piece of equipment--no sense in it. It didn't pay off for anybody.

Figure 28 shows a real fine traffic pattern--a real fine one, guys going in all directions. There happened to be a guy I knew for quite awhile running this job. I said, "Man, what are you doing here, look at this, how can you make money? Everybody is in each other's way, nobody knows where the other guy is." They had about 10 kids out there picking up the roots and why they hadn't killed somebody already I don't know. No job planning and no traffic pattern so the other guy doesn't know what the other fellow's doing. This doesn't



PX-D-52481 NA

Figure 28--Traffic jams mean poor business planning as well as dangerous working conditions.

make sense, and I don't think it makes much money, either, for anybody.

Now one of our real serious ones is shown in Figure 29. Four of our men were wiped out. There is a little lesson here I want to tell you about. A terrible thing. The front engine coming downhill just got to the portal of the tunnel and met a loaded train with 40 cars going uphill. The train coming downhill was doing as much as 25 miles an hour, the one going uphill about 17--this isn't guesswork because they've got tattletails on them on tape and you can measure the tape, so we know what they were doing. Now why? There are four men dead, and they are the only ones that could really tell you why. I can tell you this, beyond the shadow of a doubt there is no indication that the signals weren't working before the accident, and after a very careful scrutiny they were working after the accident, so it doesn't leave you much room to wonder what happened. The heat was intense, just simply burned everything. It was so hot (it happened at 9 o'clock at night) that by daylight the next morning you still couldn't really get around the thing. Now, needless to say, there was a big investigation, and I want to mention this last for one reason. There's a lesson here. After the accident they called in experts from all over the country to talk about this accident and set up things so that this won't happen again. The Vice President of the General Railway Signal Company came out from New York and made some suggestions on some rather complicated equipment. While they were getting equipment installed, they put an extra man on the train to call the signals. He is going to call a block signal back to the



Figure 29--The locomotive operator could have been color blind.

dispatcher. When the dispatcher says "Go" they will go past the switch. If he doesn't say Go, the engineer stops. And so the dispatcher said, "Go," and we had opposing trains on the track looking each other right in the eye. Thank God, one old engineer was on his toes and he got her hauled down or we'd have had another four dead men. Then some fool down on the ground said, "Can't that knothead tell the difference between red and green?" He couldn't--and so all the experts, including old Marr, who were out there looking at a hell of an accident had missed the simple little thing of checking to see if these guys can tell the difference between red and green. Now, how the hell the guy had been operating 5 or 6 hours and somebody didn't discover this I don't know, but there were some real embarrassed people around, including me, I can tell you that. If we had had another accident there because Marr missed asking if these fellows had been checked for red and green color blindness, I think I'd have just folded her up and gone on down the road. That's how bad I felt about that thing.

Any day that you think you're tough, come out with me and talk to the mother of this young boy--there was one young fellow wiped out in this accident. It was a mistake to go out there. I tried to tell the head agent it was a mistake but he was a longtime friend who had gone to school with the kid, knew the whole family, and belonged to the same church, and he said, "You got to go with me." I went out there and the mother said, "Can I ask you one question, honestly?" I said, "Well, yes," and she said, "Did my son have time to pray before he died?" Right about that time old Marr wasn't feeling very tough, I can tell

you that. And so I say to you fellows, it's the little things that count. Isn't that color blindness stupid? I missed it; so did all the experts.

How many things are there that you fellows don't think about as you go down the road? How many times do you see something and you don't raise a question? I've worked in construction for 25 years and I know that when the people in inspection want to ask questions and make them stick you've got a big hammer--so I challenge you fellows to ask more questions. You guys have a lot of authority, you have years of experience, and you've got some top-flight construction people out there, but too often they are not saying very much. I know this isn't your prime responsibility and I'm not trying to weasel out of our responsibility in labor or management, but I'd like to leave you fellows with one thought: Are you asking questions that should be asked? Thank you.

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

1st QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH September 30, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL #			
Washington Office	327	453,096					
Denver Office	1,457	2,283,344	2		9	0.9	4
Alaska District	45	65,399					
REGION 1							
Boise Regional Office	188	287,293	1		3	4.4	13
Baker Project	20	35,675					
Central Snake Project	47	60,987	1		1	16.4	16
Chief V. serv. Dam	33	40,311					
Columbia Basin Project	854	1,342,176	2		323	6.7	241
Lower Columbia Development Office	53	82,148					
Man. Creek Project	45	54,333					
Miridoka Project	21	26,000	1		150	34.5	5,769
Snake River Project	71	122,865	1		19	8.1	155
Snake River Development Office	29	74,223					
Spokane Valley Project	32	55,061					
The Dalles	48	9,731					
Upper Columbia Development Office	49	62,460					
Yakima Project	32	42,877					
Totals & Averages	1,476	2,287,419	13		496	5.8	220
REGION 2							
San Francisco Regional Office	621	1,044,023					
Auburn Field Office	41	45,206	1		4	21.4	87
Cachuma Operations Field Branch	2	3,104					
Central Coast Development Field Br.	6	9,264					
Folsom Field Division	46	113,407					
Pescano CVP Construction Office	113	141,010					
Pescano Field Division	146	227,097					
Shasta Project Office	10	14,201					
Lahontan Basin Projects Office	28	33,212					
Mapa Development Branch	7	12,258					
Red Bluff CVP Construction Office	97	146,448					
Yuma Transmission Lines Office	32	47,056					
San Luis Unit CVP Construction Office	510	884,175	3		127	3.4	144
Shasta Field Division	130	208,601					
Colano Operations Field Branch	2	3,104					
Tracy Field Division	172	208,987					
Upper North Coast Field Branch	4	6,560					
Willows CVP Construction Office	121	196,832					
Totals & Averages	2,113	3,459,486	4		131	1.2	38
REGION 3							
Boulder City Regional Office	142	244,400					
Boulder Canyon Project Office	163	238,683					
Boulder City Development Office	12	31,312					
Dixie Project Office	27	59,154					
Lower Colorado River Control:							
Citola Field Division	97	130,062					
Laguna Field Division	19	24,862					
Needles Field Division	52	66,869					
Pala Verde Field Division	20	27,872					
Parker-Davis Project	325	524,453					
Phoenix Development Office	111	171,520					
Southern California Development Office	41	62,436					
Yuma Projects Office	143	290,960					
Totals & Averages	1,179	1,981,298					
REGION 4							
Salt Lake City Regional Office	255	428,341					
Central Utah Project	167	232,785					
CRSP Power Operations	171	307,335	1		6,000	3.3	19,523
Quercanti Unit	175	255,642					
Durango Projects Office	29	50,012					
Emery County		28,004					
Glen Canyon Field Division	140	265,520					
Grand Junction Projects	106	164,924					
Logan Development Office	12	19,500					
Kranan Project	30	28,654					
Seedskadee Project	29	42,473					
Upper Green River Project Office	9	13,486					
Weber Basin Projects	97	171,668	1		4	5.8	23
Totals & Averages	1,229	2,009,284	2		6,004	1.0	2,988
REGION 5							
Amarillo Regional Office	119	180,223					
Albuquerque Development Office	39	60,203					
Arbuckle Project	26	63,574					
Austin Development Office	43	70,966					
Canadian River Project	128	233,340					
Lower Rio Grande Project	2	5,064					
Middle Rio Grande Project	199	316,583	3		73	9.5	231
Navajo Project	82	125,159	2		30	16.0	240
Oklahoma City Development Office	18	27,403					
Rio Grande Project	227	349,997	3		48	8.6	137
San Juan-Chama Project	76	104,150					
Totals & Averages	950	1,536,662	8		151	5.2	98
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT
GOVERNMENT FORCES

3rd QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH September 30, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL*	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	169	248,800					
Geology and Drill Crews	18	26,653		2	45	75.0	1,688
Canyon Ferry Project	21	24,724					
Fort Peck Project	36	51,231					
Missouri-Oahe Projects	170	268,800		1	5	3.7	19
Missouri-Souris Projects	151	180,962		2	39	11.1	216
Power System Operations Office	44	65,040					
Riverton Project	5	12,019					
Upper Missouri Projects	124	170,283					
Yellowtail Project	101	154,215		1	6,000	6.5	38,907
Totals & Averages	839	1,202,727		6	6,089	5.0	5,063
REGION 7							
Denver Regional Office	222	342,824					
Fryingpar-Arkansas Project	264	382,520		3	41	7.8	107
Kansas River Projects	233	379,220					
Niobrara-Lower Platte Projects	70	167,620		1	5	6.0	30
North Platte River Projects	268	435,280					
South Platte River Projects	166	253,464		2	76	7.9	300
Totals & Averages	1,223	1,960,928		6	122	3.1	62

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

3rd QUARTER, 1966

PERIOD FROM JANUARY 1, 1966.. THROUGH September 30, 1966..

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR FATAL *			
DENVER OFFICE	167	232,661					
REGION 1							
Baker Project	57	83,092	5		55	60.2	662
Chief Joseph Dam	6	27,310	1		45	36.6	1,648
Columbia Basin Project	131	227,731	3		10	13.2	44
Mann Creek Project	130	112,511	2		50	16.7	502
Minidoka Project		531					
Rogue Project		5,027					
Snake River Development Office		380					
Spokane Valley Project	56	83,605					
The Dalles		2,480					
Yakima Project	3	6,870					
Totals & Averages	383	556,376	11		170	19.8	306
REGION 2							
Fresno Field Division		5,365	1		5	186.5	932
Fresno CVP Construction Office	86	77,062					
Red Bluff CVP Construction Office	205	278,036	2		67	7.2	240
Reno Transmission Lines Lines	15	27,443					
San Luis Unit CVP Construction Office	2,047	2,978,776	32	3	23,583	10.7	7,912
Shasta Field Division		1,566					
Tracy Field Division		1,713					
Willows CVP Construction Office	421	430,213	2		93	4.6	216
Totals & Averages	2,774	3,909,772	37	3	23,748	9.7	6,234
REGION 3							
Cibola Field Division	46	35,989	2		3,041	55.6	24,492
Needles Field Division		4,258					
Palo Verde Field Division	24	81,119					
Parker-Davis Project	111	236,056	6		151	25.4	640
Yuma Projects Office	37	30,430					
Totals & Averages	218	389,552	8		3,192	20.5	8,188
REGION 4							
Central Utah Project	17	15,162					
Curecanti Unit	480	938,820	3		240	3.2	256
Durango Projects Office		9,510	1		1	105.1	105
Emery County		27,451					
Glen Canyon Field Division	155	356,583	4		188	11.2	527
Grand Junction Projects	206	240,153	7		56	23.1	233
Lyman Project	70	39,262	1		300	25.5	7,641
Needskadee Project	42	57,630	1		9	17.4	156
Weber Basin Projects	78	92,805	4	2	12,255	43.1	131,923
Totals & Averages	1,048	1,777,487	21	2	13,047	11.8	7,351
REGION 5							
Amarillo Regional Office	25	26,993					
Arbuckle Project	106	219,527					
Austin Development Office		548					
Canadian River Project	293	880,000	7		399	8.0	453
Navajo Project	239	385,965	13	1	6,215	33.7	16,102
Rio Grande Project		360					
San Juan-Chama Project	521	584,577	11	1	6,512	18.8	11,140
Totals & Averages	1,184	2,097,970	31	2	13,126	14.8	6,257
REGION 6							
Fort Rock Project		919					
Missouri-Cabe Projects	23	17,003					
Missouri-Souris Projects	2	4,962					
Riverton Project		5,426					
Upper Missouri Projects	348	214,178	5		56	23.3	261
Yellowtail Project	124	330,562	3		20	9.1	51
Totals & Averages	497	573,050	8		76	14.0	133
REGION 7							
Denver Regional Office	5	20,440					
Dryden-Arkansas Project	837	949,294	17	2	12,715	17.0	13,304
Kansas River Projects	441	715,764	6	2	12,020	8.3	16,723
North Platte Plate Projects	34	67,289	1		25	14.0	372
North Platte River Projects	85	63,139	3		4,512	47.5	71,556
South Platte River Projects	6	3,245					
Totals & Averages	1,408	1,822,171	27	4	29,278	14.8	16,068
CONSOLIDATED TOTALS	7,679	11,265,339	143	11	82,639	12.7	7,336
TOTALS LAST YEAR (1965)	7,181	15,624,209	223	8	58,024	14.3	3,718

*FATALITIES INCLUDED IN TOTAL DISABLING

YOU CAN'T STOP ON A DIME !



Cunningham, HAM, & Co.
Region 7

AVERAGE STOPPING DISTANCES FOR PASSENGER CARS

ON DRY ROAD INCLUDING
REACTION TIME

20 MPH  3 CAR LENGTHS

30 MPH  6 CAR LENGTHS

40 MPH  9 CAR LENGTHS

50 MPH  16 CAR LENGTHS

60 MPH  23 CAR LENGTHS

70 MPH  33 CAR LENGTHS

NOTE: These distances are for routine stops by vehicles in average condition driven by the average driver. "Emergency" or "panic" stops will shorten these distances in some situations, while poor condition of the vehicle, driver or road surface will increase them.



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SAFETY

70

RECLAMATION SAFETY NEWS

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Annual Report 1966 *Fourth Quarter*

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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BUREAU SAFETY PERFORMANCE

1966 CUMULATIVE SAFETY RECORD CY 1966

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Alaska District	0.0	0.0	0	0.0
Region 3	0.1	0.4	20	2.1
Region 2	0.5	1.5	33	3.8
Region 7	1.2	2.4	48	2.5
Region 5	7.3	4.9	148	3.8
Region 4	28.1	1.2	2,343	2.3
Region 1	109.3	5.0	2,187	2.8
Region 6	<u>168.9</u>	<u>4.4</u>	<u>3,839</u>	<u>2.7</u>
Totals (1966)	19.9	2.3	864	3.1
Totals (1965)	7.4	2.8	264	2.9

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	67.7	20.9	324	0
Region 4	571.6	9.6	5,954	2
Region 2	594.8	11.5	5,172	3
Region 5	761.1	13.6	5,596	2
Region 3	1,067.6	16.3	6,550	0
Region 1	1,675.3	20.7	8,093	1
Region 7	<u>2,269.9</u>	<u>16.5</u>	<u>13,757</u>	<u>5</u>
Totals (1966)	908.4	13.4	6,779	13
Totals (1965)	531.7	14.3	3,718	8

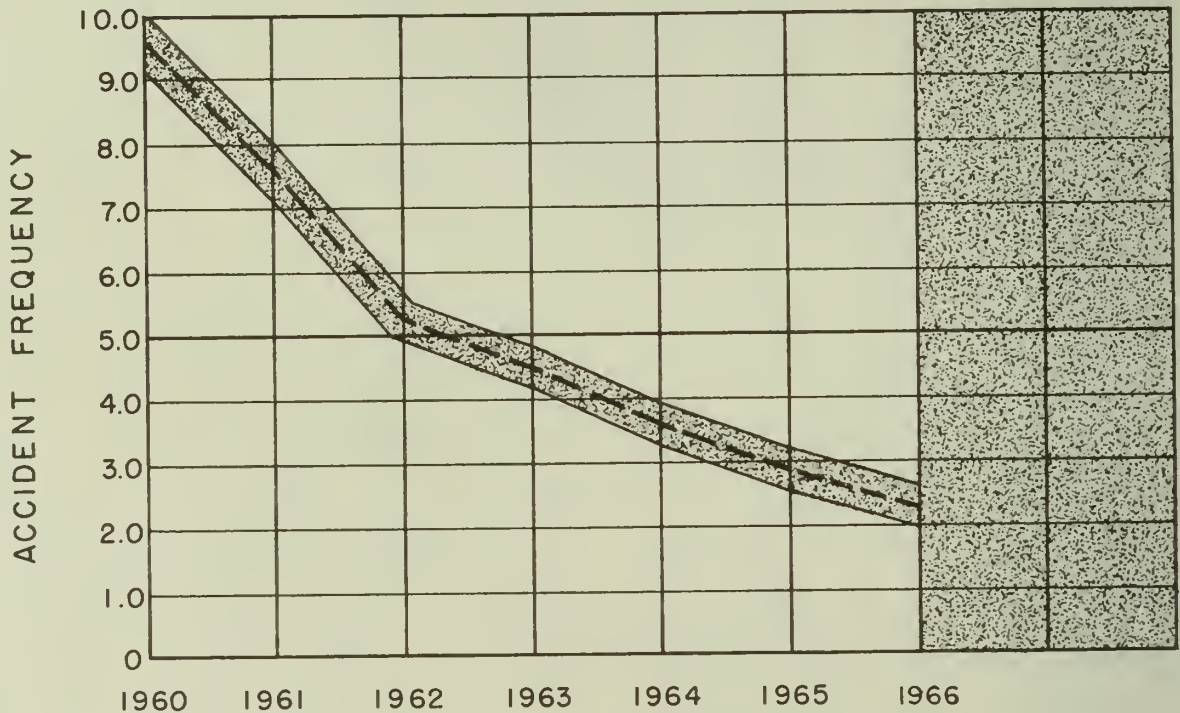
BUREAU CONTRACTORS' 3-YEAR AVERAGE (1964-1966):

Frequency rate	13.4
Severity rate	4,161

C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate	4.0
Severity rate	759
Vehicle accident rate	33.1

GOVERNMENT FORCES



TREND and OUTLOOK

In 1966, for the sixth consecutive year, Reclamation achieved the lowest accident frequency rate in its 64-year history. During the year, Bureau employees worked over 22 million man-hours with only 51 disabling injuries. The continuing reduction in the accident frequency rate attests to the fact that our safety efforts are basically realistic and effective. This commendable record could not have been achieved without the dedicated participation and involvement of every individual in the safety program.

Particularly significant and gratifying is the fact that since 1964 the disabling accident rate has been reduced from 3.6 to 2.3. This 36 percent improvement surpasses the 30 percent reduction envisioned by Mission SAFETY-70 by 1970.

Contrasting with the reduction in the accident frequency rate is the increase in accident severity. One Bureau employee lost his life and two others were seriously injured during the year. As a result, 1966 cannot

be considered truly satisfactory from the standpoint of safety achievement. The ability to perform our work without serious injury or death has to be the requisite for ultimate safety achievement.

This was the first year that we employed automation to compile accident information to evaluate safety performance. The results of these machine studies were made available to the regional and operating offices. One result of the computer analysis was the obvious need for improved safety indoctrination and safety education for employees in the following occupations: Electricians' Helpers, Construction Inspectors, Laborers, and Irrigation Systems Operators. During 1967 we intend to expand and improve this phase of accident analysis and safety performance evaluation.

Considering the attitude and safety awareness indicated by Bureau supervisors and employees, further improvement should be made in 1967. Based upon the experience of the past year, greater emphasis should be placed upon the prevention of accidents resulting from equipment and vehicle operation. Also more effective measures must be taken to avoid accidental contact with high-voltage transmission lines in our power and irrigation operations.

The following accident statistical tabulations indicate areas of strength and weakness and should be helpful in directing our efforts to specific locations, operations, and phases of accident prevention requiring improvement.

WORK ACTIVITY - BUREAUWIDE

<u>Type of work</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration	8,884,539	7	152	0.8	17
Construction	4,978,010	12	6,485	2.4	1,303
Investigations	2,356,026	6	90	2.5	38
Irrigation O&M	2,756,058	13	6,294	4.7	2,284
Power O&M	<u>3,468,391</u>	<u>13</u>	<u>6,364</u>	<u>3.7</u>	<u>1,835</u>
1966 Totals	22,443,024	51	19,385	2.3	864
1965 Totals	23,061,414	64	6,087	2.8	264

ORGANIZATIONAL UNIT

Washington Office

Major activity	Man-hour exposure	Disabling injuries	Days lost	Frequency rate	Severity rate
1966 Totals	615, 792	0	0	0.0	0
1965 Totals	577, 600	0	0	0.0	0

Denver Office

1966 Totals	3, 001, 232	2	9	0.7	3
1965 Totals	3, 002, 736	0	0	0.0	0

Alaska District

Construction	656	0	0	0.0	0
Investigations	46, 562	0	0	0.0	0
Power O&M	<u>40, 109</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1966 Totals	87, 327	0	0	0.0	0
1965 Totals	107, 359	1	13	9.3	121

Region 1

Administration	482, 033	4	139	8.3	288
Construction	549, 153	2	219	3.6	399
Investigations	345, 625	0	0	0.0	0
Irrigation O&M	814, 473	4	6, 095	4.9	7, 483
Power O&M	<u>809, 934</u>	<u>5</u>	<u>112</u>	<u>6.2</u>	<u>138</u>
1966 Totals	3, 001, 218	15	6, 565	5.0	2, 187
1965 Totals	3, 051, 588	31	768	10.2	252

Region 2

Administration	1, 089, 302	0	0	0.0	0
Construction	1, 581, 697	4	135	2.5	85
Investigations	517, 042	1	4	1.9	8
Irrigation O&M	737, 304	1	2	1.4	3
Power O&M	<u>595, 720</u>	<u>1</u>	<u>8</u>	<u>1.7</u>	<u>13</u>
1966 Totals	4, 521, 065	7	149	1.5	33
1965 Totals	4, 214, 527	2	160	0.5	38

Region 3

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration	641, 680	0	0	0.0	0
Construction	493, 024	0	0	0.0	0
Investigations	380, 754	0	0	0.0	0
Irrigation O&M	170, 160	0	0	0.0	0
Power O&M	<u>764, 418</u>	<u>1</u>	<u>50</u>	<u>1.3</u>	<u>65</u>
1966 Totals	2, 450, 036	1	50	0.4	20
1965 Totals	2, 493, 975	7	218	2.8	87

Region 4

Administration	1, 179, 918	1	4	0.8	3
Construction	857, 798	1	87	1.2	101
Investigations	292, 182	0	0	0.0	0
Irrigation O&M	64, 231	0	0	0.0	0
Power O&M	<u>205, 704</u>	<u>1</u>	<u>6, 000</u>	<u>4.9</u>	<u>29, 168</u>
1966 Totals	2, 599, 833	3	6, 091	1.2	2, 343
1965 Totals	2, 974, 002	9	91	3.0	31

Region 5

Administration	497, 902	0	0	0.0	0
Construction	514, 430	2	30	3.9	58
Investigations	215, 289	0	0	0.0	0
Irrigation O&M	706, 671	7	195	9.9	276
Power O&M	<u>95, 472</u>	<u>1</u>	<u>76</u>	<u>10.5</u>	<u>796</u>
1966 Totals	2, 029, 764	10	301	4.9	148
1965 Totals	2, 174, 120	6	197	2.8	91

Region 6

Administration	538, 960	0	0	0.0	0
Construction	318, 165	2	6, 009	6.3	18, 886
Investigations	256, 556	2	45	7.8	175
Irrigation O&M	115, 795	0	0	0.0	0
Power O&M	<u>359, 089</u>	<u>3</u>	<u>44</u>	<u>8.4</u>	<u>123</u>
1966 Totals	1, 588, 565	7	6, 098	4.4	3, 839
1965 Totals	1, 735, 814	2	4	1.2	2

Region 7

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration	837, 720	0	0	0.0	0
Construction	663, 087	1	5	1.5	8
Investigations	302, 016	3	41	9.9	136
Irrigation O&M	147, 424	1	2	6.8	14
Power O&M	<u>597, 945</u>	<u>1</u>	<u>74</u>	<u>1.7</u>	<u>124</u>
1966 Totals	2, 548, 192	6	122	2.4	48
1965 Totals	2, 729, 693	6	4, 636	2.2	1, 699

ANALYSIS OF DISABLING INJURIES

In the following tables we have classified the 51 disabling injuries suffered during 1966 by operation, occupation, and other classification criteria pertinent to the analysis of injury experience:

OPERATION	<u>No. of injuries</u>
Administration	7
Construction	12
Investigation	6
O&M Irrigation	13
O&M Power	<u>13</u>
Total	51

OCCUPATION	
Administrative, Office and Clerical	5
Field Engineering and Surveys	12
Irrigation Systems Operation	5
Electricians, Linemen, and Groundmen	6
Construction Inspectors	4
Mobile Industrial Equipment Operation	6
Operator, General	4
Powerplant Operator	3
Warehousemen	2
Other	<u>4</u>
Total	51

AGE GROUP	<u>No. of injuries</u>
18 - 25 years	6
26 - 40 years	13
41 - 60 years	27
Over 60 years	<u>5</u>
Total	51

ACCIDENT CLASSIFICATION

<u>Type</u>	<u>Description</u>	<u>No.</u>	<u>Days lost</u>
5	Vehicles	11	374
9	Electricity	2	12, 000
10	Flash burns	1	6
11	Chemical burns	1	4
12	Handling materials	12	310
13	Falling objects	4	339
14	Falls of persons	12	215
17	Flying particles	1	5
18	Handtools	1	8
19	Machinery	5	6, 120
20	Other (tick bite)	<u>1</u>	<u>4</u>
	Totals	51	19,385

TIME EXTENT OF INJURY

	<u>No. of injuries</u>	<u>Days lost</u>
Temporary total disability	47	1, 310
Permanent partial disability	3	12, 075
Fatals	<u>1</u>	<u>6, 000</u>
Totals	51	19, 385
Three days or less	4	8
Over three days	<u>47</u>	<u>19, 377</u>
Totals	51	19, 385

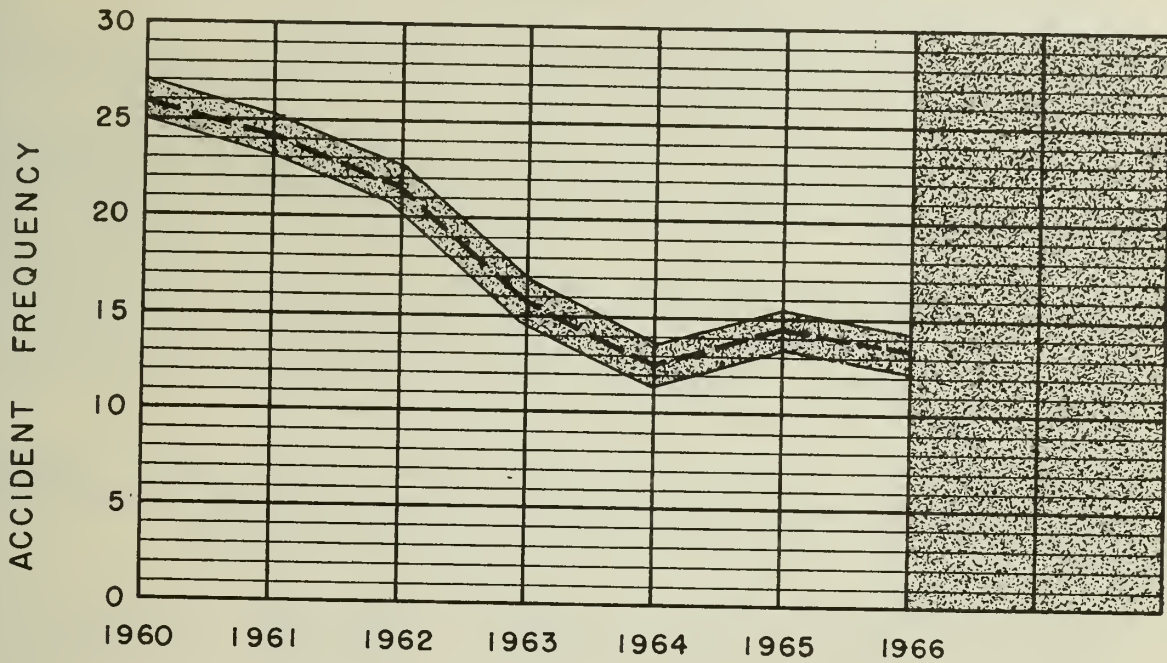
SERIOUS OR FATAL INJURIES

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
1-11-66	Foreman III Lineman	Electric power burns	6,000 (Nonfatal)
6-16-66	O&M Superintendent	Crushed by mobile crane	6,000 (Fatal)
11-4-66	Irrigation Operator	Electric power burns	6,000 (Nonfatal)

<u>PART OF BODY INJURED</u>	<u>No. of injuries</u>
Eyes	1
Face	4
Head	4
Neck	2
Shoulders	3
Arms	6
Hands and fingers	8
Ribs	3
Abdomen	2
Back	8
Hips	2
Knees	4
Legs	4
Ankles	3
Foot	5
Toes	1

* * * * *

CONTRACTOR FORCES



TREND and OUTLOOK

Bureau contractors completed the year with an accident frequency rate of 13.4 disabling injuries per million man-hours worked. While this is the second lowest contractor accident frequency rate of record in Reclamation's history, it cannot be considered satisfactory. There has been no appreciable reduction in the number of disabling injuries suffered by contractor employees. More unsettling are the increase in the severity rate and the increase in the number of fatal accidents, which claimed the lives of 13 contractor employees during 1966.

In analyzing the 13 fatalities, it is evident that the majority of them could have been prevented had our construction safety requirements been observed. Most of the fatal accidents resulted either from excavation operations or from the operation of heavy construction equipment. The latter cause is typical of the experience of the past 5 years.

The following action is necessary if we are to revise the adverse trend and realize any tangible improvement in the contractor safety record:

1. Greater emphasis must be placed upon this phase of contract administration in order to insure full compliance with Bureau construction safety requirements.
2. All construction supervisors and inspectors should complete the 30-hour Safety Training Course for Construction Supervisors and Inspectors as soon as possible. Since this program was undertaken in January 1965, over 860 construction supervisors and inspectors have completed the course.
3. Revision of "Safety Requirements for Construction by Contract" incorporating improved safety techniques to cope with the hazards incident to the operation of heavy equipment.

Construction supervisors throughout the Bureau are currently placing greater emphasis on compliance with the construction safety requirements. Arrangements are being made to insure that all construction inspectors complete their training commitments as soon as possible. "Safety Requirements for Construction by Contract, Third Edition," is being revised, and the new edition will include--among other improvements--provision for roll-over bars and emergency braking systems on designated types of earthmoving equipment. It should be pointed out that many contractor associations and manufacturers of heavy equipment are participating in these efforts to develop practical improvements for the safety of construction personnel.

Due to the steps already taken or contemplated, together with the support and participation of the contractors, labor, and others, we can look to the future with increased optimism. The conservation of life, time, and money--desired objectives of Reclamation and the construction industry--is contingent upon the success of these efforts.

WORK ACTIVITY - CONTRACTOR FORCES

<u>Type of work</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	5, 075, 240	57	29, 287	11. 2	5, 771
Concrete dams	1, 729, 492	18	449	10. 4	260
Earth dams	3, 508, 603	39	30, 953	11. 1	8, 822
Tunnels	2, 190, 531	57	27, 153	26. 0	12, 396
Transmission lines and substations	897, 256	6	308	6. 7	343
Miscellaneous	<u>1, 075, 321</u>	<u>17</u>	<u>9, 987</u>	<u>15. 8</u>	<u>9, 287</u>
1966 Totals	14, 476, 443	194	98, 137	13. 4	6, 779
1965 Totals	15, 624, 209	223	58, 084	14. 3	3, 718

ORGANIZATIONAL UNIT

Region 1

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	420, 886	7	6, 099	16. 6	14, 491
Concrete dams	7, 464	0	0	0. 0	0
Earth dams	315, 079	9	162	28. 6	514
Transmission lines and substations	7, 270	0	0	0. 0	0
Miscellaneous	<u>22, 947</u>	<u>0</u>	<u>0</u>	<u>0. 0</u>	<u>0</u>
1966 Totals	773, 646	16	6, 261	20. 7	8, 093
1965 Totals	520, 811	10	6, 166	19. 2	11, 839

Region 2

Canals	3, 044, 547	34	18, 177	11. 2	5, 970
Earth dams	1, 299, 709	8	186	6. 2	143
Tunnels	233, 574	11	6, 735	47. 1	28, 835
Transmission lines and substations	103, 214	0	0	0. 0	0
Miscellaneous	<u>178, 050</u>	<u>3</u>	<u>33</u>	<u>16. 8</u>	<u>185</u>
1966 Totals	4, 859, 094	56	25, 131	11. 5	5, 172
1965 Totals	4, 345, 409	67	17, 562	15. 4	4, 042

Region 3

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	149,317	1	19	6.7	127
Earth dams	8,448	0	0	0.0	0
Transmission lines and substations	302,746	5	148	16.5	489
Miscellaneous	<u>29,242</u>	<u>2</u>	<u>3,041</u>	<u>68.4</u>	<u>103,994</u>
1966 Totals	489,753	8	3,208	16.3	6,650
1965 Totals	864,386	17	6,632	19.7	7,672

Region 4

Canals	147,922	1	1	6.7	7
Concrete dams	1,078,598	6	268	5.6	248
Earth dams	643,384	11	6,320	17.1	9,823
Tunnels	15,583	0	0	0.0	0
Transmission lines and substations	259,840	1	160	3.8	616
Miscellaneous	<u>46,210</u>	<u>2</u>	<u>6,300</u>	<u>43.3</u>	<u>136,334</u>
1966 Totals	2,191,537	21	13,049	9.6	5,954
1965 Totals	3,077,310	25	12,586	8.1	4,090

Region 5

Canals	1,012,177	7	399	6.9	394
Earth dams	91,048	0	0	0.0	0
Tunnels	1,328,249	28	14,044	21.1	10,573
Miscellaneous	<u>149,308</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1966 Totals	2,580,782	35	14,443	13.6	5,596
1965 Totals	2,514,373	54	1,742	21.5	693

Region 6

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	26, 071	2	45	76. 7	1, 726
Concrete dams	581, 304	12	181	20. 6	311
Transmission lines and substations	37, 806	0	0	0. 0	0
Miscellaneous	<u>72, 860</u>	<u>1</u>	<u>7</u>	<u>13. 7</u>	<u>96</u>
1966 Totals	718, 041	15	233	20. 9	324
1965 Totals	1, 743, 440	19	541	10. 9	310

Region 7

Canals	274, 320	5	4, 547	18. 2	16, 576
Concrete dams	62, 126	0	0	0. 0	0
Earth dams	1, 150, 935	11	24, 285	9. 6	21, 100
Tunnels	613, 125	18	6, 374	29. 4	10, 396
Transmission lines and substations	186, 380	0	0	0. 0	0
Miscellaneous	<u>316, 218</u>	<u>9</u>	<u>606</u>	<u>28. 5</u>	<u>1, 916</u>
1966 Totals	2, 603, 104	43	35, 812	16. 5	13, 757
1965 Totals	2, 316, 080	26	12, 781	11. 2	5, 518

Denver Office

Miscellaneous	260, 486	0	0	0. 0	0
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RECLAMATION JOB CORPS CENTERS

1966 CUMULATIVE ACCIDENT RECORD

<u>Region</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Region 1	1, 597, 736	8	41	5.0	25
Region 2	2, 178, 240	14	6, 102	6.4	2, 801
Region 4	1, 835, 652	5	41	2.7	22
Region 5	789, 898	4	26	5.1	33
Region 7	1, 794, 996	2	10	1.1	5
Totals	8, 196, 522	33	6, 220	4.0	759

SERIOUS ACCIDENTS OR FATALITIES

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
8-11-66	Job Corps enrollee	Accidentally drowned while swimming	6, 000*

*Fixed time charge for fatality

VEHICLE ACCIDENT EXPERIENCE

<u>Region</u>	<u>No. of accidents</u>	<u>Mileage</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
Region 1	11	462, 590	23.7	\$ 1, 660
Region 2	22	449, 474	48.9	3, 518
Region 4	14	592, 193	23.6	1, 590
Region 5	3	133, 780	22.4	250
Region 7	21	505, 127	41.6	4, 093
Totals	71	2, 143, 164	33.1	\$11, 111

Vehicle accidents involving Job Corps staff: 11

Vehicle accidents involving Job Corps enrollees: 60

* * * * *

VEHICLE ACCIDENTS

THE FOLLOWING TABLE SHOWS BUREAU VEHICLE ACCIDENT EXPERIENCE SINCE 1958:

<u>Year</u>	<u>No. of accidents</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
1966	125	3.1	\$26, 771
1965	116	2.9	23, 205
1964	114	2.8	36, 410
1963	134	3.4	25, 130
1962	125	3.4	33, 100
1961	151	4.6	41, 255
1960	75	2.7	32, 960
1959	93	3.3	34, 940
1958	146	4.9	37, 980

*Number of accidents per million miles driven

THE FOLLOWING TABLE COMPARES THE VEHICLE ACCIDENT EXPERIENCE OF MAJOR ORGANIZATIONAL UNITS OF RECLAMATION FOR CALENDAR YEAR 1966:

<u>Region</u>	<u>No. of accidents</u>	<u>Mileage</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
Alaska District	0	52, 477	0.0	\$ 0
Denver Office	3	203, 188	14.8	75
Region 1	16	5, 707, 643	2.8	3, 199
Region 2	39	10, 390, 376	3.8	11, 690
Region 3	10	4, 750, 521	2.1	1, 696
Region 4	10	4, 415, 440	2.3	3, 062
Region 5	22	5, 823, 688	3.8	3, 928
Region 6	11	4, 044, 150	2.7	1, 769
Region 7	<u>14</u>	<u>5, 535, 438</u>	<u>2.5</u>	<u>1, 352</u>
Totals	125	40, 922, 921	3.1	\$26, 771
1965 Bureau totals	116	40, 609, 306	2.9	\$23, 205

*Number of accidents per million miles driven

Note: Estimated damage covers only the cost to repair or replacement of the Government vehicle involved.

* * * * *

ACCIDENT COSTS

Accidents do not always involve personal injury to employees but may result in the destruction or loss of property and third-party claims. Consideration and review of costs resulting from accidents is essential to the appraisal of any accident prevention program. The following summary of estimated accident costs for calendar years 1966, 1965, 1964, and 1963 is presented for this purpose:

<u>Type of accident</u>	<u>1966</u>	<u>Estimated cost</u>		<u>1963</u>
		<u>1965</u>	<u>1964</u>	
Work injuries ^{1/}				
Disabling injuries	\$ 33,000	\$ 39,488	\$ 54,351	\$ 57,324
Nondisabling injuries	7,920	10,096	8,120	8,568
Fatal injuries	57,038	52,825	159,507	155,559
Fires	55,261	3,340	166,160	3,620
Tort claims ^{2/}	27,027	4,439	62,508	37,512
Employee claims	207			
Motor vehicle accidents	26,771	23,205	24,681	25,131
Other property damage	<u>2,232</u>	<u>16,054</u>	<u>2,069</u>	<u>6,445</u>
Totals	\$209,456	\$149,447	\$477,396	\$294,159

^{1/}Cost estimate based on past 5-year average cost.

^{2/}Tort claims resulting from accidents adjudicated during 1963, 1964, 1965, and 1966.

The costs shown are estimated direct costs resulting from accidents.

STUDIES CONDUCTED BY COMPETENT AND
RECOGNIZED AUTHORITIES INDICATE THAT
INDIRECT ACCIDENT COSTS EXCEED DIRECT
ACCIDENT COSTS BY A RATIO OF 4:1

* * * * *

PUBLIC SAFETY

RECORD OF PUBLIC DROWNINGS

<u>Bureau-operated Facilities:</u>	<u>CY66</u>	<u>CY65</u>	<u>CY64</u>
Canals	14	22	14
Dams	0	0	0
Reservoirs	1	3	8
Total	<u>15</u>	<u>25</u>	<u>22</u>

Facilities Operated by Others:

Irrigation and Water Districts	15	14	20
State or County (Recreational)	19	39	29
Total	<u>34</u>	<u>53</u>	<u>49</u>

Summary of Total Drownings During Period:

By Operating Agency:

Bureau of Reclamation	15	25	22
Irrigation and Water Districts	15	14	20
State or County (Recreational)	19	39	29
Total	<u>49</u>	<u>78</u>	<u>71</u>

By Type of Facility:

Canals	27	34	31
Dams	0	0	0
Reservoirs	22	44	40
Total	<u>49</u>	<u>78</u>	<u>71</u>

By Activity:

Swimming	15	23	25
Boating	6	14	12
Fishing	2	7	5
Fell into water	19	24	19
Other	7	10	10
Total	<u>49</u>	<u>78</u>	<u>71</u>

By Age:

Under 12 years of age	19	19	19
From 12 to 25	12	22	27
From 25 to 50	10	23	19
Over 50 years of age	8	14	6
Total	<u>49</u>	<u>78</u>	<u>71</u>

* * * * *

SAFETY AWARDS

AWARD OF HONOR

and

DEPARTMENT OF THE INTERIOR SAFETY AWARD FOR
CALENDAR YEAR 1965



PX-D-54819 NA

Secretary of the Interior Stewart L. Udall (right) presented two top safety awards--third year in a row--to Commissioner Floyd E. Dominy. Secretary Udall presented to the Bureau of Reclamation the 1965 plaques for the National Safety Council's highest award--the Award of Honor, and the Department's highest--the Interior Annual Safety Award.

COMMISSIONER'S ANNUAL SAFETY AWARD - 1966

Presented to Region 3, Boulder City, Nevada, in recognition of the best safety record for Government forces during calendar year 1966.

DEPARTMENT OF THE INTERIOR
SAFETY COUNCIL AWARD OF MERIT



Regional Director Leon W. Hill presents Award of Merit to C. O. Crane, Project Construction Engineer, Canadian River Project, Amarillo, Texas.

The award was made to Mr. Crane in recognition of the exemplary safety record during construction of the Canadian River Project. The project entailed construction of a major dam and a 322-mile municipal water-supply system, involving an expenditure of \$85 million over a period of 5 years. Contractors on the project achieved a commendable accident safety record with a minimum number of work injuries. Further, there was only one contractor fatality in over 5-1/2 million man-hours of contractor exposure involving heavy construction work.

Under the supervision of Project Construction Engineer C. O. Crane, Bureau employees of the Canadian River Project have accumulated well over 1,000,000 man-hours of relatively hazardous work without a single disabling injury commencing October 2, 1963, and continuing to the present time. As a result of this commendable record, project employees were recently presented the Department of the Interior Certificate of Safety Achievement. Shown below are (left to right): Messrs. Leon W. Hill, A. V. Ruple, John C. Thompson, J. C. Williams, C. O. Crane, and V. E. Seyfried.



PX-500-10 NA

NATIONAL SAFETY COUNCIL AWARDS
(PRESENTED TO REGIONS)

AWARD OF HONOR (1965)

Region 2--Sacramento, California
Region 3--Boulder City, Nevada
Region 4--Salt Lake City, Utah
Region 5--Amarillo, Texas
Region 6--Billings, Montana

NATIONAL FLEET SAFETY CONTEST



Regional Safety Engineer Ronald J. Searle (above right) accepts the "first-place" safe-driving award on behalf of Region 4 employees who drove over 1,660,000 miles without a reportable passenger car accident during fiscal year 1965-66. This award was presented by Mr. William H. Franey of the Motor Transportation Section of the National Safety Council at the contest award luncheon in Chicago on October 27, 1966.

First Place in the Government Truck Division, Group II, was won by Region 5, Amarillo, Texas.

THE DEPARTMENT OF THE INTERIOR'S
CERTIFICATE OF SAFETY ACHIEVEMENT AWARD--1966

In recognition of over 500,000 man-hours without a disabling injury:

Boulder Canyon Project--Boulder City, Nevada
Missouri-Oahe Projects Office--Huron, South Dakota
Red Bluff CVP Construction Office--Red Bluff, California
Shasta Field Division--Redding, California

In recognition of over 1,000,000 man-hours without a disabling injury:

Canadian River Project--Amarillo, Texas
Glen Canyon Field Division--Page, Arizona
North Platte River Projects--Casper, Wyoming
Weber Basin Job Corps Conservation Center--Ogden, Utah
Yuma Projects Office--Yuma, Arizona

In recognition of over 500,000 accident-free miles:

Canadian River Project--Amarillo, Texas
Glen Canyon Field Division--Page, Arizona
Niobrara-Lower Platte Projects--Grand Island, Nebraska
Red Bluff CVP Construction Office--Red Bluff, California
Rio Grande Project--El Paso, Texas

In recognition of over 1,000,000 accident-free miles:

Curecanti Unit Office, CRSP--Montrose, Colorado
Fryingpan-Arkansas Project--Pueblo, Colorado
South Platte River Projects--Loveland, Colorado
Willows CVP Construction Office--Willows, California
Yuma Projects Office--Yuma, Arizona

In recognition of over 2,000,000 accident-free miles:

Missouri-Souris Projects Office, Bismarck, North Dakota

CONSTRUCTION SAFETY AWARD--1966

The Construction Safety Award is presented to contractors in recognition of exemplary safety records achieved while performing work for Reclamation. To be eligible, a contractor must have initiated and carried out an effective safety program during the term of his contract. He must have achieved a cumulative accident record lower than the average record obtained by all Bureau contractors during the preceding 3-year period. Equally important, he must have indicated a sincere interest in the safety of his employees by virtue of expending the time and effort necessary to carry out an aggressive and continuing safety effort. The following Bureau contractors earned Construction Safety Awards during 1966:

E. D. Baker Construction Company, Borger, Texas
Bushman Construction Company, St. Joseph, Missouri
C-L Electric Company, Pocatello, Idaho
Chicago Bridge & Iron Company, San Francisco, California
Chicago Bridge & Iron Company, Seattle, Washington
W. W. Clyde & Company, Springville, Utah
Coastal Bend Construction Company and Electric Construction Company, Inc., Corpus Christi, Texas (a joint venture)
C.S.P. Engineering Company, Casper, Wyoming
Darkenwald Construction Company, Inc., Sacramento, California, and Morrison-Knudsen Company, Inc., Boise, Idaho (a joint venture)
Dominion Construction Company, Lincoln, Nebraska
Donovan Construction Company, St. Paul, Minnesota
Ets-Hokin & Galvan, Inc., Denver, Colorado
E-W Construction Company and L. D. Shilling, Inc., Creswell, Oregon
Foley Brothers, Inc., St. Paul, Minnesota
Judson Pacific-Murphy Corporation, Oakland, California
Martindale and Blackett, Springville, Utah
Missouri Valley Construction Company, Grand Island, Nebraska
Purtzer and Dutton, Reno, Nevada
Sandkay Construction Company, Ephrata, Washington
Service Construction Company, Sun Valley, California
Tco, Inc., Pampa, Texas
H. R. Wagstaff Company, Inc., and R. C. Jones Company, Salt Lake City, Utah
R. A. Wattson Company, Panorama City, California
Weaver Construction Company, Iowa Falls, Iowa
Western States Construction Company, Inc., Loveland, Colorado
Wismer & Becker, Sacramento, California

* * * * *

BUREAU SAFETY TRAINING -- PROGRESS REPORT

Total number of employees who have completed Bureau safety training commitments since inception of these programs in 1965:

	N. S. C. Driver Improvement Training	<u>Safety Training Course for</u> <u>Construction Supervisors and Inspectors</u>	
		<u>30-hour course</u>	<u>One or more sessions</u>
Alaska District	13	0	0
Region 1	1, 129	96	17
Region 2	1, 506	144	279
Region 3	1, 190	33	63
Region 4	1, 183	235	30
Region 5	811	76	18
Region 6	606	49	35
Region 7	<u>736</u>	<u>230</u>	<u>0</u>
Totals	<u><u>7, 174</u></u>	<u><u>863</u></u>	<u><u>442</u></u>

* * * * *

The Bureau of Reclamation was the recipient of the following citation:

BEST PERFORMANCE BY AN AGENCY OF THE FEDERAL GOVERNMENT

...in the National Safety Council's Driver Improvement Program for 1966.

* * * * *

SAFETY OBJECTIVES

PAST IS PROLOGUE

We can take justifiable pride in the continuing drop in the accident rates for both Government and contractor forces. However, the mounting severity rates, particularly in contractor operations, dictate the direction of future accident prevention endeavors. While continuing to emphasize safety in all Reclamation operations, following established policy and practices, the course of action outlined below is planned to improve the contractor safety record.

Safety Training Program for Construction Supervisors. This training, developed by the Associated General Contractors of America, consists of 30 hours of instruction in all phases of construction safety. While 863 construction supervisors and inspectors have completed this training since its inception in January 1965, some officers have not achieved their commitment of 100 percent by the end of 1966. Therefore, every effort will be made to insure that all construction supervisors and inspectors complete the training as soon as possible. Also, we plan to encourage O&M operating offices to make this training available for operation and maintenance personnel.

Revision of "Safety Requirements for Construction by Contract." The provisions of this manual, pertaining to all contractor operations, are currently being revised, incorporating improved and more stringent safety provisions governing the use of heavy construction equipment. Provisions requiring the installation of roll-over bars and emergency braking systems on designated types of earthmoving equipment have been drafted and are currently being reviewed by the Associated General Contractors of America, the Society of Automotive Engineers, manufacturers of equipment and others. The revised edition of "Safety Requirements for Construction by Contract" will be published during 1967.

Compliance With Bureau Safety Requirements. Construction engineers have been asked to place greater emphasis on this phase of contract administration in order to insure full compliance with Bureau construction safety requirements.

In addition to the above, we plan to thoroughly explore the adoption of new methods and techniques to improve our vehicle accident experience. Together with the Federal Government and the National Safety Council, we consider the problem of coping with the mounting toll of highway deaths and injuries to be the greatest safety challenge facing the Nation today. While we have made some progress by virtue of having given the National Safety Council's Driver Improvement Training to over 7,000 Bureau employees, it is obvious from the record that this is not enough.

During the year we will consider means of updating and improving the driver licensing procedures currently being followed. In many operating offices the procedures being followed in issuing driving permits are barely minimal and of little, if any, use in determining the applicant's ability or competency to safely operate a Government vehicle.

REAFFIRMATION OF POLICY

The achievement to date, particularly the 36 percent reduction in injuries to Government employees within a 2-year period--contrasted with the 5-year period envisioned by Mission SAFETY-70--indicates that Reclamation's safety policy is both a realistic and effective approach to accident prevention. Now is the time for greater dedication and enlarged efforts if further achievement is to be realized. Safety is an unending responsibility of management, requiring the involvement and participation of every man and woman in the safety program.

* * * * *

DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

4th QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH December 31, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Washington Office	327	615,792					
Denver Office	1,436	3,001,232	2		9	0.7	3
Alaska District	42	87,327					
REGION 1							
Noise Regional Office	180	311,701	1		3	3.2	10
Baker Project	31	51,051					
Central Snake Project	38	78,941	1		1	12.7	13
Chief Joseph Dam Project	37	60,310					
Columbia Basin Project	839	1,787,232	11		6,314	6.2	3,533
Hungry Horse Project	51	109,014					
Lower Columbia Development Office	42	82,201					
Mann Creek Project	20	35,708	1		228	28.0	6,385
Minidoka Project	65	157,352	1		19	6.4	121
Rogue Project		4,560					
Snake River Development Office	49	100,080					
Spokane Valley Project	29	69,978					
The Dalles Project		9,731					
Upper Columbia Development Office	47	87,100					
Yakima Project	30	56,257					
Totals & Averages	1,458	3,001,218	15		6,565	5.0	2,187
REGION 2							
Sacramento Regional Office	591	1,318,633					
Regional Drill Crew	29	59,160					
Auburn-Folsom South Unit CVP Office	52	70,378	1		4	14.2	57
Cachuma Operations Field Branch	2	4,030					
Central Coast Development Field Branch	6	12,073					
Folsom Field Division	67	149,565					
Fresno CVP Construction Office	117	207,944					
Fresno Field Division	144	297,280					
Klamath Project Office	16	44,659					
Lahontan Basin Projects Office	38	74,620					
Napa Development Field Branch	7	15,458					
Red Bluff CVP Construction Office	75	185,304					
Reno Transmission Lines Office	28	62,280					
San Luis Unit CVP Construction Office	462	1,127,713	4		135	3.5	120
Shasta Field Division	135	276,038	1		8	3.6	29
Solano Operations Field Branch	2	4,080					
Tracy Field Division	176	356,826	1		2	2.8	5
Upper North Coast Field Branch	5	8,752					
Willows CVP Construction Office	119	246,192					
Totals & Averages	2,071	4,521,065	7		149	1.5	33
REGION 3							
Boulder City Regional Office	156	327,460					
Boulder Canyon Project Office	139	312,555					
Boulder City Development Office	19	41,024					
Dixie Project Office	21	71,634					
Lower Colorado River Control:							
Needles Field Division	52	91,684					
Palo Verde Field Division	17	37,702					
Cibola Field Division	99	179,692					
Laguna Field Division	19	33,958					
Mead Construction Office	12	2,112					
Parker-Davis Project	313	678,434	1		50	1.5	74
Phoenix Development Office	110	224,480					
Southern California Development Office	37	81,894					
Yuma Projects Office	159	367,440					
Totals & Averages	1,153	2,450,036			50	0.4	20
REGION 4							
Salt Lake City Regional Office	245	557,154					
Central Utah Project	160	310,889					
Oquirrh Unit Office	158	311,658	1		87	3.0	262
CRSP Power Operations Office	172	326,921	1		6,000	2.5	15,115
Durango Projects Office	28	63,747					
Esmer County Project		28,904					
Glen Canyon Field Division	137	338,020					
Grand Junction Projects	80	208,196					
Logan Development Office	12	25,740					
Lyman Project	25	41,275					
Seedskadee Project	28	58,305					
Upper Green River Development Office	7	17,126					
Weber Basin Projects	85	221,868	1		4	4.5	18
Totals & Averages	1,137	2,599,833	3		6,091	1.2	2,343
REGION 5							
Amarillo Regional Office	116	238,036					
Albuquerque Development Office	36	80,680					
Arbuckle Project	22	76,630					
Austin Development Office	49	94,624					
Canadian River Project	97	204,022					
Lower Rio Grande Project	2	6,056					
Middle Rio Grande Project	220	435,305	4		113	9.2	260
Navajo Project	85	169,448	2		30	11.8	177
Oklahoma City Development Office	18	34,993					
Rio Grande Project	213	459,285	4		158	8.7	344
San Juan-Chama Project	77	140,615					
Totals & Averages	935	2,029,764	10		301	4.9	148
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

* FATALITIES INCLUDED IN TOTAL DISABLING

DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
SAFETY PERFORMANCE RECORD
CUMULATIVE QUARTERLY REPORT
GOVERNMENT FORCES

4th QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH December 31, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL*	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	168	329,760					
Geology and Drill Crews	17	32,454	2		45	61.6	1,387
Canyon Ferry Project	17	32,572					
Fort Peck Project	36	69,572					
Missouri-Oahe Projects	166	349,920	1		5	2.9	14
Missouri-Souris Projects	150	253,115	2		39	7.9	154
Power System Operations Office	46	90,480					
Riverton Project	5	14,064					
Upper Missouri Projects	113	221,153					
Yellowtail Project	94	195,477	2	1	6,009	10.2	30,740
Totals & Averages	812	1,588,565	7	1	6,098	4.4	3,839
REGION 7							
Denver Regional Office	221	416,912					
Pryingpan-Arkansas Project	259	517,260	3		41	5.8	79
Kansas River Projects	226	498,092					
Niobrara-Lower Platte Projects	53	197,752	1		5	5.1	25
North Platte River Projects	265	583,360					
South Platte River Projects	165	334,816	2		76	6.0	227
Totals & Averages	1,189	2,548,192	6		122	2.4	48
(Average number of Government employees during 1966: 11,024)							
CONSOLIDATED TOTALS	10,560	22,443,024	51	1	19,385	2.3	864
TOTALS LAST YEAR (1965)	11,112	23,061,414	64	0	6,087	2.8	264
* FATALITIES INCLUDED IN TOTAL DISABLING							
JOB CORPS CONSERVATION CENTERS							
Columbia Basin Job Corps Center							
Staff	49	161,868	1		4	6.1	25
Corpsmen	147	661,864	2		4	3.7	6
Marsing Job Corps Center							
Staff	42	174,580	2		6	11.4	34
Corpsmen	104	599,424	3		27	4.7	43
Leaviston Job Corps Center							
Staff	52	294,144	3		11	10.2	37
Corpsmen	188	1,131,552	6		6,022	5.3	5,322
Toyon Job Corps Center							
Staff (Including 1 VISTA)	34	204,112	2		38	9.8	186
Corpsmen	90	548,432	3		31	5.5	57
Collbran Job Corps Center							
Staff	34	65,868	2		12	30.4	182
Corpsmen	108	638,184			29	4.7	45
Weber Basin Job Corps Center							
Staff	51	100,032					
Corpsmen	181	1,031,568					
Arbuckle Job Corps Center							
Staff	31	167,808					
Corpsmen	114	622,090	4		26	6.4	42
Casper Job Corps Center							
Staff	48	224,148					
Corpsmen	115	588,320					
McCook Job Corps Center							
Staff	43	253,200					
Corpsmen	130	729,328	2		10	2.7	14
TOTAL STAFF	389	1,645,760	10		71	6.1	43
TOTAL CORPSMEN	1,177	6,550,762	23	1	6,149	3.5	939
CONSOLIDATED TOTALS	1,566	8,196,522	33	1	6,220	4.0	759
TOTALS LAST YEAR (1965)	1,208	2,376,952	10	1	6,036	4.2	2,539
* FATALITIES INCLUDED IN TOTAL DISABLING							

GPO 833-654

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

4th QUARTER, 1966

PERIOD FROM JANUARY 1, 1966 THROUGH December 31, 1966

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
DENVER OFFICE	60	260,486					
REGION 1							
Baker Project	90	128,831	6		90	46.6	699
Chief Joseph Dam	64	48,084	3		62	62.4	1,289
Columbia Basin Project	135	299,833	4	1	6,010	13.3	20,044
Mann Creek	126	183,083	3		72	16.4	393
Minidoka		831					
Rogue Project		5,026					
Snake River Development Office		920					
Spokane Valley Project	13	96,827					
The Dalles Project		2,480					
Yakima Project	9	7,731					
Totals & Averages	437	773,046	16	1	6,261	20.7	8,093
REGION 2							
Fresno CVP Construction Office	68	113,343	1		300	8.8	2,647
Fresno Field Division	20	7,752	1		5	128.0	640
Lahontan Basin Projects Office	54	12,530					
Red Bluff CVP Construction Office	90	344,056	2		67	5.8	195
Reco Transmission Lines Office	1	31,431					
San Luis Unit CVP Constr. Office	1,271	3,791,181	49	3	24,621	12.9	6,547
Shasta Field Division		8,564					
Tracy Field Division		1,953					
Willows CVP Construction Office	102	548,234	3		138	5.5	252
Totals & Averages	1,606	4,859,094	56	3	25,131	11.5	5,172
REGION 3							
Cibola Field Division	20	46,032	2		3,041	43.4	66,064
Needles Field Division		4,258					
Palo Verde Field Division	28	100,097	1		19	9.9	190
Parker-Davis Project	166	307,173	5		148	16.3	482
Yuma Projects Office		32,193					
Totals & Averages	214	489,753	8		3,208	16.3	6,650
REGION 4							
Central Utah Project	5	19,681					
Quercanti Unit	305	1,138,017	3		240	2.6	211
Durango		10,256	1		1	97.5	98
Emery County Project		27,451					
Glen Canyon Field Division	67	405,681	4		188	9.9	463
Grand Junction Projects Office	82	310,697	7		56	22.5	180
Lyman Project	38	64,044	1		300	15.6	4,684
Seedskeade Project	69	104,523	1		9	9.6	86
Weber Basin Projects	14	111,187	4	2	12,255	36.0	110,220
Totals & Averages	580	2,191,537	21	2	13,049	9.6	5,954
REGION 5							
Amarillo Regional Office		30,224					
Arbuckle Project	31	238,255					
Austin Development Office		548					
Canadian River Project	196	983,146	7		399	7.1	405
Navajo Project	215	500,787	17	1	7,440	33.9	14,857
Rio Grande Project		360					
San Juan-Chama Project	349	827,462	11	1	6,604	13.3	7,981
Totals & Averages	791	2,580,782	35	2	14,443	13.6	5,596
REGION 6							
Fort Peck Project	3	1,395					
Missouri-Osage Projects	9	21,036					
Missouri-Souris Projects		4,862					
Riverton Project		5,828					
Upper Missouri Projects	102	310,279	11		203	35.5	654
Yellowtail Project	50	373,541	4		30	10.7	80
Totals & Averages	164	718,041	15		233	20.9	324
REGION 7							
Denver Regional Office	21	21,532					
Dryden-Arkansas Project	783	1,389,666	29	2	13,008	20.9	9,360
Kansas River Projects	430	1,000,197	9	3	18,230	9.0	18,194
Nimrod-Lower Platte Projects	20	72,271	1		25	13.8	346
North Platte River Projects	62	115,354	4		4,549	34.7	3,944
South Platte River Projects		4,084					
Totals & Averages	1,316	2,603,104	43	5	35,812	16.5	13,757
(Average number of contractor employees during 1966: 7,175)							
CONSOLIDATED TOTALS	5,168	14,476,443	194	13	98,137	13.4	6,779
TOTALS LAST YEAR (1965)	7,181	15,624,209	223	8	58,084	14.3	3,718

*FATALITIES INCLUDED IN TOTAL DISABLING

**MISSION
SAFETY**

70

RECLAMATION SAFETY NEWS

THE LIBRARY OF THE



First Quarter 1967

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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Safety Performance Record

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Front Cover Photo: Bureau of Reclamation's New Engineering and
Research Center, Denver, Colorado PX-D-57020

SAFETY OF DAMS

We would like to emphasize that our safety of dams program is being carried forward primarily as the result of our desire to prevent disasters which involve great loss of life and property damage. While our older structures, constructed 25 years or more ago, were entirely adequate to contain or pass the anticipated potential flood at that time, advanced practices of modern meteorological and hydrological sciences have proven conclusively that modification of some of those dams is absolutely necessary. This is further substantiated by storms of record intensities which have occurred during the past several years in parts of the Western States.

Of approximately 220 structures under jurisdiction of Reclamation, we have found that about 56 require a critical examination of their capability to pass or contain the maximum potential flood. Some of the modifications found necessary include only an updating of operation instructions while in other cases the spillway requires enlarging or the dam must be raised to assure sufficient freeboard against overtopping. We have found cases where dams constructed by others upstream from ours were unsafe, thus constituting a hazard to the downstream structure. We alerted the Governors of the 17 Western States to this situation, and they have assured us of their full support in a joint program to seek out and correct deficiencies.

About six months ago, Secretary Udall directed that Reclamation take leadership in examining all dams under jurisdiction of Department of the Interior agencies. That program is now underway in cooperation with Bureau of Indian Affairs, Bureau of Sport Fisheries and Wildlife, Bureau of Land Management, and the National Park Service.

We are now drafting legislation to be presented to the 90th Congress to authorize the Secretary of the Interior to modify dams if and when necessary to assure their safety. As a part of that legislation we are proposing that the Secretary of the Interior be authorized to develop in cooperation with representatives of other Federal agencies, the States and other persons and organizations, a code of standards for investigation, construction, operation and inspection of dams. At the present time, no such standard exists for dams constructed within the United States. Through the proposed legislation, the Federal Government would take the lead in developing such standards.

---Reprinted from Remarks by
Commissioner of Reclamation
Floyd E. Dominy before the
House Interior and Insular
Affairs Committee, January 31,
1967.

BUREAU SAFETY PERFORMANCE

1967 CUMULATIVE SAFETY RECORD

January 1 - March 31, 1967

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 4	0.0	0.0	0	1.3
Region 6	0.0	0.0	0	2.5
Region 2	0.2	1.0	18	1.4
Region 7	0.8	1.7	49	4.0
Region 5	4.0	4.4	92	6.1
Region 1	20.4	6.5	314	8.4
Region 3	40.1	9.0	445	2.7
Alaska District	<u>213.4</u>	<u>46.2</u>	<u>462</u>	<u>0.0</u>
Totals to Date	3.2	2.9	112	3.7
Totals 1966	19.9	2.3	864	3.1

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	0.0	0.0	0	0
Region 2	38.2	11.3	338	0
Region 4	91.5	13.5	678	0
Region 1	43.6	20.2	216	0
Region 3	220.0	18.2	1,209	0
Region 5	433.1	27.5	1,575	0
Region 7	<u>3,939.7</u>	<u>25.3</u>	<u>15,572</u>	<u>1</u>
Totals to Date	689.1	18.6	3,705	1
Totals 1966	908.4	13.4	6,779	13

C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate	3.3
Severity rate	94
Vehicle accident rate	24.6

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1967
First Quarter

Cumulative to Date:
March 31, 1967

A. ACCIDENT CLASSIFICATION

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Vehicles	3	104
Handling materials and equipment	8	413
Falls of persons	3	52
Rattlesnake bite	<u>1</u>	<u>18</u>
	15	587

B. OPERATIONAL SUMMARY

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	2, 164, 897				
Construction	1, 022, 056	6	340	5. 9	333
Investigation	543, 503				
Power O&M	857, 227	5	171	5. 8	199
Irrigation O&M	<u>654, 064</u>	<u>4</u>	<u>76</u>	<u>6. 1</u>	<u>116</u>
Totals	5, 241, 747	15	587	2. 9	112

* * * * *

ON-THE-JOB SAFETY AT ALL-TIME HIGH

Most jobs in the United States are safer than ever before in history. Only about one person in 10, 000 is now turned down for an ordinary life insurance policy because of occupational hazards, and those employed as policemen, bank and prison guards, professional athletes and movie stars--once rated risky and sometimes uninsurable--are now considered safe and no longer require extra insurance premiums.

Experts point to three main factors which are making jobs safer: (1) Safety engineering is paying off in better lighting, improved sanitation and other precautions; the accident frequency in plants has been cut in half in the past 25 years. (2) Dramatic advances in industrial medicine are keeping workers alive both by eliminating health hazards and by quicker, better treatment. (3) Home life in America is much safer today--we eat more nutritious food, live more comfortably and spend more time away from the job.

* * * * *

SAFETY AWARDS

NATIONAL SAFETY COUNCIL AWARDS FOR 1966

The following divisions of Reclamation earned National Safety Council awards for accident records achieved during 1966:

Bureau of Reclamation

Bureauwide	Award of Merit
Alaska District	Certificate of Commendation
Region 2	Award of Honor
Region 3	Award of Honor
Region 5	Award of Merit
Region 7	Award of Honor

DEPARTMENT OF THE INTERIOR CERTIFICATE OF SAFETY ACHIEVEMENT

The employees of the Red Bluff CVP Construction Office, Red Bluff, California, earned Certificates of Safety Achievement in recognition of working 685,151 man-hours during the period April 30, 1963, through September 30, 1966, without a lost-time injury, and in recognition of driving 877,947 accident-free miles from June 1, 1965, to August 9, 1966. Shown in the photograph below are members of the Project Safety Committee, left to right: D. H. Warren, Chief of the Engineering Control Division; G. D. Forshay, Project Safety Officer; W. C. Bouett, Field Engineer; D. R. Alexander, Project Construction Engineer; C. S. English, Office Engineer; H. M. Zilkey, Head of Personnel Section; and Dale Minshall, Materials Engineer.



X-D-57599 NA

Employees of the Yuma Projects Office, Yuma, Arizona, gather around their "Safety Sign" to commemorate the achievement of one million man-hours worked without a disabling injury. An average of 192 employees worked 27 injury-free months to attain this goal.



X-D-57600 NA

South Platte River Projects, Loveland, Colorado--George D. Winans, Regional Safety Engineer, is shown below (left) presenting the Department of Interior's Certificate of Safety Achievement to G. R. Highley, Project Manager, in recognition of the Project's driving record of over 1,000,000 miles without an accident.



P245-713-3893 NA

CONSTRUCTION SAFETY AWARD

MSI Corporation Earns Reclamation Construction Safety Award: On March 2, 1967, Reclamation's Chief Engineer, B. P. Bellport (pictured below, left), presented to J. D. Moore (right), Project Manager, MSI Corporation, an award in recognition of the exemplary safety record achieved during construction of the Reclamation Office Building at Denver Federal Center, Denver, Colorado. The building was constructed at a cost of over 6 million dollars during the period October 1964 to March 1967.



PX-D-57216

Construction Safety Awards were presented recently to the following contractors who completed work under their contracts with the Bureau of Reclamation without a single disabling injury:

Syblon-Reid Construction Company--Specifications No. DC-6333--
Construction of seven turnouts, canal drain, and pump sump covers
for the San Luis Canal, Reach 1, Central Valley Project, California.

United Nations Constructors, Inc.--Specifications No. DC-6359--
Underground Irrigation System for the Colusa County Water District,
Unit 1B--Central Valley Project, California.

Brasel & Sims Construction Company--Specifications No. DC-6433--
Fontenelle Dam Embankment Repairs--Seedskaadee Project, Wyoming.

* * * * *

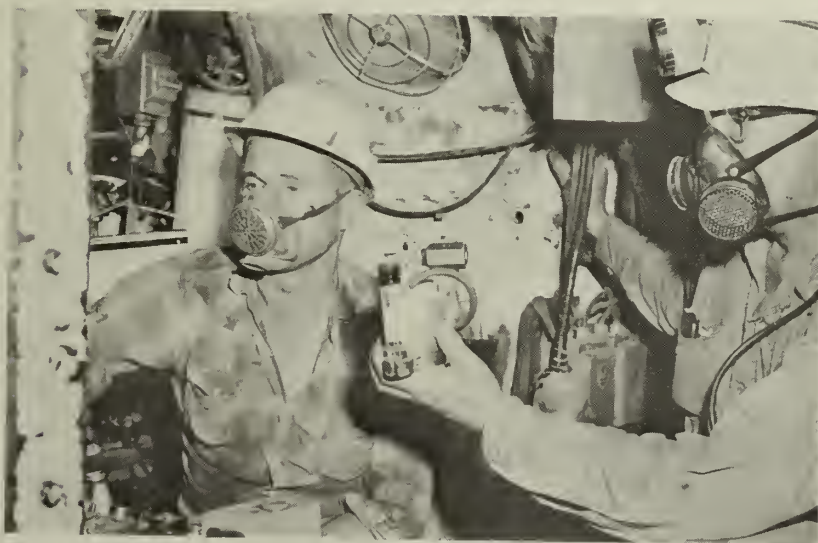
FROM THE FIELD

San Juan-Chama Project, Santa Fe, New Mexico: The Colorado Bureau of Mines presented an "Award of Merit" to Colorado Constructors, Inc., and A. S. Horner Construction Company, Inc. --prime contractor on Blanco Tunnel--for outstanding effort and cooperation in the promotion of safety in the mineral industry during 1966.

Pictured below is Mr. Paul Schapiro of the U.S. Bureau of Mines conducting dust sample studies in the Blanco Tunnel.



X-D-57601 NA



X-D-57602 NA

Shown above is a dust sample being taken at the operator's position on the "mole" (which was used in drilling Blanco Tunnel). Note cooling fan in background.

WHY WEAR A HARD HAT?

Two More Bureau Employees Become "Turtle Club" Members

Curecanti Unit, Montrose, Colorado: Mr. Donald Penman (pictured below, right), holding the hard hat that saved his life, receives his membership certificate into the "Turtle Club" from Mr. J. D. Seery, Project Construction Engineer (pictured below, left). Mr. Penman was working as a surveyor for the Bureau of Reclamation at Morrow Point when a large rock fell from the cliff above and struck him. Although he received serious injuries, the hard hat was credited with saving his life.



P622B-427-8044 NA

Columbia Basin Project, Ephrata, Washington: Mr. Dale L. Price, who is now custodian at Grand Coulee Dam, was working as an irrigation operator when the swinging shackle of a 20-pound hoist cable hit him on the head. The hard hat he was wearing protected him from serious injury. The photograph below shows Mr. Price receiving a new hard hat with the "Turtle Club" insignia and a membership certificate from Mr. R. K. Seely, Chief, Power Field Division, Coulee Dam, Washington.



X-D-57603 NA

The objective of the Turtle Club is to emphasize the importance of safety head protection. Their motto is "Shell on Head -- We're not dead." The international organization, founded in 1946, is sponsored by the E. D. Bullard Company, a manufacturer of hard hats. To be eligible for membership an individual must credit the wearing of a safety hard hat with preventing a fatal or serious head injury.

Alaska District--Physicals for Powerplant Operators and Operators of Hoisting Equipment: Work is continuing on setting up a program for annual physicals for powerplant operators and operators of hoisting equipment. These physicals will be given by Elmendorf Air Force Base Hospital at no charge to the Bureau of Reclamation.

Columbia Basin Project, Ephrata, Washington--Annual Pre-Irrigation Season Ditchrider Safety Meetings Held at Warden, Mesa, Royal and Quincy: H. R. Gray, Chief, Irrigation and Land Division, spoke to each group of the development and increased emphasis on safety during his career with the Bureau of Reclamation. He stressed employee responsibility for accident control. Electrical maintenance safety was discussed and a film, "Builders of Tomorrow," was shown. One hundred and seventy-five Irrigation and Land Division personnel attended these meetings.

* * * * *

BUREAU SAFETY TRAINING -- PROGRESS REPORT

Shown below are the number of employees who have completed Bureau safety training commitments since inception of these programs in 1965 through March 31, 1967.

	NSC Driver Improvement Training	Safety Training Course for Construction Supervisors and Inspectors 30-hour course	One or more sessions
Region 1	1, 175	128	0
Region 2	1, 572	188	245
Region 3	1, 190	43	0
Region 4	1, 357	253	0
Region 5	836	92	2
Region 6	662	83	3
Region 7	837	256	0
Alaska			
District	13	0	0
Denver			
Office	222	0	0
Totals	<u>7, 864</u>	<u>1, 043</u>	<u>250</u>

* * * * *

WATER SAFETY

Columbia Basin Project, Ephrata, Washington: March 20 marked the beginning of a Water Safety Lyric Contest for the youth of Ephrata. The contest is sponsored by the Ephrata Safety Council, in cooperation with the schools, and will extend through Friday, April 28, 1967. After the lyrics are judged and awards made, the Council will use the material as a means of further stimulating interest in water safety.

Weber Basin Projects Office, Ogden, Utah--Bonneville Water Safety Council: A course for training instructors in Basic Outboard Boating and Small Craft Safety has been set up through the Bonneville Chapter of the American Red Cross. The course will require 9 hours of lectures, and a practical demonstration will be set up at one of the nearby reservoirs. There will be no fee other than a small charge for the booklet.

Arbuckle Project, Sulphur, Oklahoma: Shown below is a typical "Danger" sign. This back-to-back sign has been placed in the area between the river outlet works and spillway chutes in the stilling basin, with one side facing the water and the other side facing inland.



X-D-57604 NA

* * * * *

VEHICLE SAFETY

NOT BUCKLING DOWN: MOST MOTORISTS SHUN 'UGLY, COLD' SEAT BELTS

Lady Smashes Warning Light on T-Bird, Man Snips Belts;
But Frank and Mia Use Them

(By Tom Metz, Staff Reporter--Reprinted, with permission,
from The Wall Street Journal, January 26, 1967)

A lot of the really big couples in Hollywood do it. Batman and Robin. The Green Hornet and Kato. Frank and Mia. AND THAT'S GOOD.

But Sharon Anderson, Pamela Hollebrands and Roy Singleton don't. AND THAT'S BAD.

Those are the assessments, at any rate, of the auto makers and the safety forces that want people to buckle their auto seat belts. They are concerned because they have found that most people--like Miss Anderson, Mrs. Hollebrands, and Mr. Singleton--don't use the belts, which are standard equipment on all new cars sold in the U.S.

Indeed, estimates and studies indicate that only 4% to 26% of American drivers buckle up for safety despite data that show the belts save lives and keep injuries down. What's more, it seems there is more than passive resistance among the nonusers. For instance:

Ford Motor Co. says one woman recently took off her shoe and used the spiked heel to smash part of the instrument panel on her 1966 Thunderbird. She wanted to extinguish permanently the reminder light that glows until the driver buckles up. (On the 1967 T-Birds, the light goes off after 10 seconds, whether the belt is buckled or not.)

A construction worker in Detroit took delivery of his new car and then carefully snipped off the belts when he got home.

Safety experts find this widespread disdain hard to understand, since the benefit of wearing belts has been clearly demonstrated. Yet talks with nonusers turn up a variety of reasons. "They give me cramps," says an office worker in Detroit. "They rumple your dress," says Miss Anderson, a switchboard operator.

Mrs. Hollebrands is pregnant, and she asks: "What if I was in an accident and wearing my seat belt? What would happen to my baby?" Mr. Singleton, a teletype repairman in Detroit, says, "I've been in three accidents where the car was totally demolished. I was thrown out of the car in all three, and you can bet if I'd been held in the car by a belt I wouldn't be here today."

Safety experts say pregnant women should wear seat belts because they wouldn't be thrown around if they were in an accident. They also dispute Mr. Singleton's claim; they say the chances of surviving an accident are far better if you are belted and stay in the car.

Ernest Dichter, who runs the Institute for Motivational Research, says the problem is that "seat belts have a very confusing image in the motorist's mind. Are they warm and protective, or cold, authoritarian and threatening?" His firm has made a study of belt users.

One young teacher told the Dichter researchers: "On a date, I'd take the man without a seat belt. There's something sort of homely, stodgy and cowardly about these belts." A young housewife said seat belts recalled ugly childhood memories: "Well, it's like sitting on a toilet, being strapped down to the toilet."

To win these people over, seat belt proponents are trying new ways of promoting the belts. The American Seat Belt Council, an organization of belt makers, is making short filmstrips for television, showing unbelted dummies being thrown through the windshield in collisions. "Some people can be convinced only by being frightened," says a spokesman.

The council claims credit for getting Batman and Robin and the Green Hornet and Kato to use seat belts on their television programs. Former Council President Ray Brown, a sales official for American Safety Equipment Corp., personally designed burnt-orange belts for a Sinatra car. ("Mr. Sinatra wouldn't think of going anywhere without buckling up," says a Warner Bros. receptionist sweetly, "and he's got all of us using our seat belts all the time, too.")

The council has hired a public relations man to convince moviemakers to show persons buckling, has recorded radio commercials ("Please fasten. . . please fasten your. . . please fasten your seat belt. Thank you." to a staccato beat) and has mounted a billboard campaign.

Ideally, the seat belt forces would like the belts to be used as much as they are on airliners, where the Government requires the belts be used. Eastern Air Lines says it is rare for a passenger to refuse, although it recalls that several years ago an Eastern plane made an unscheduled stop to eject a passenger who refused to fasten his belt during a period of air turbulence.

Safety officials hope that once the public is persuaded to use seat belts, they will think about using shoulder belts, which give extra protection in collisions. So far, though, few shoulder belts have been sold, and convincing the public may be even harder than the seat belt campaign. Says the wife of an auto executive: "Anybody that thinks they'll get me to put a strap across my bosom has got another think coming."

SEAT BELT VERDICT PROMOTES SAFETY

---Safety Newsletter, Construc-
tion Section National Safety
Council

A recent decision of a Sheboygan, Wisconsin, circuit court jury may be more effective than any of the present educational methods in persuading motorists to strap themselves into the front seat.

According to the "Appleton Post-Crescent," the jury found a woman driver negligent for not using the seat belts in her car and deducted ten percent from the damages awarded her.

The judge submitted the question to the jury along with his normal instructions. He reminded the jury that Wisconsin law provides that belts must be installed in new cars sold in the state since 1962, and commented that: "...it must follow that the legislature intended that these seat belts be used."

It is the first time that a jury has been asked to take this matter into account in assessing liability. And their decision may well set a precedent. If so, not using seat belts will cost a driver or even a passenger real money!

WHAT IS GOOD TRAFFIC VISION?

Distance Acuity--Your ability to focus and see clearly with each eye separately and both eyes together, particularly at a distance of many feet or yards. Probably the most important vision skill for driving, it is essential for seeing danger, reading road signs in time and for general adaptation to driving conditions.

Depth Perception--The ability to correctly judge distances between yourself and other objects, especially when both are in motion. This is essential for passing other cars in the face of oncoming traffic and for maneuvering from one lane to another among moving vehicles on streets and highways. Deficiency in this skill is one of most common defects found among drivers.

Field of Vision--The ability to see over a large area without moving either your eyes or your head, sometimes called "looking out of the corners of your eyes." This is needed to detect crossroad traffic, pedestrians at the road side or intersections, to check traffic in the rear through mirrors and to get the general driving picture.

Muscle Balance--The ability to point your eyes simultaneously with ease at a given object. This is essential for good two-eyed vision, acuity, depth perception and field of vision.

Night Vision Skills--The ability to see in the area of low illumination beyond your own headlights, to see against the glare of oncoming headlights, and the ability to recover quickly from glare. Night vision depreciates rapidly after 40 years of age. Inadequate night vision largely accounts for the fact that more accidents occur at night than during the daytime.

LOSS CONTROL DEVICE FOR DUMP TRUCKS

Many accidents have occurred and much property has been damaged because a driver forgot to lower the bed of his dump truck after he left the dump area. Telephone lines have been ripped out, bridges damaged, and in one instance a self-loading hopper was knocked over. It is doubtful that there is a heavy construction contractor who has not had this type of accident occur on his work.

A contractor on upper Columbia River Relocations Projects developed a near fool-proof device. He mounted a flashing amber caution light (3" in diameter) in the upper right-hand corner of the truck cab. The light is activated by a standard position limiting switch mounted on the exterior of the cab so that when the bed is raised more than an inch or two, the driver is reminded by the flashing light that his truck box is not in the normal haul position.

---Wardie W. King, Corps of
Engineers (National Safety
Council Construction Safety
Release No. 52)

NATIONAL DRIVERS TEST TO BE TELEVISED

The 1967 National Drivers Test will be televised in color over the CBS network, Tuesday, May 23, 1967, at:

10:00 P.M. Eastern and Pacific Standard Times

9:00 P.M. Central Standard Time

8:00 P.M. Mountain Standard Time

Check your newspaper for local time schedule. Anchorman for the show will be the award-winning newscaster, Walter Cronkite.

An Official Test Form is printed on the next page.



PRESENTS

THE NEW 1967 NATIONAL DRIVERS TEST

TUESDAY, MAY 23RD, 10-11 P.M., EDT
ON THE CBS TELEVISION NETWORK

Nearly 80 million viewers have watched the National Drivers Test the past two years — making it the most popular public service program ever carried on a single TV network.

It won the Peabody Award; the Alfred P. Sloan Radio & TV Award; and the National Safety Council Public Service Award.

Now an all-new National Drivers Test for 1967, timed for the week before Memorial Day, will provide one more hour in your life to check your ability at the defensive driving we face today.

Compare your answers with those of a studio audience of motorists, with friends' and family scores, and with correct answers provided by expert drivers.

Note the date on your calendar *now*; check the local time and channel number in your newspaper or weekly TV guide.

Fill in blanks with T or F (True or False), Y or N (Yes or No), A, B, C or D (multiple choice), or appropriate word. Opinion questions are not scored.

1. _____	<input type="checkbox"/>	4. _____	<input type="checkbox"/>
2. _____	<input type="checkbox"/>	5. _____	<input type="checkbox"/>
3. _____	<input type="checkbox"/>	6. _____	<input type="checkbox"/>

7. _____	<input type="checkbox"/>	21. _____	<input type="checkbox"/>
8. _____	<input type="checkbox"/>	22. _____	<input type="checkbox"/>
9. _____	<input type="checkbox"/>	23. _____	<input type="checkbox"/>
10. _____	<input type="checkbox"/>	24. _____	<input type="checkbox"/>
11. _____	<input type="checkbox"/>	25. _____	<input type="checkbox"/>
12. _____	<input type="checkbox"/>	26. _____	<input type="checkbox"/>
13. _____	<input type="checkbox"/>	27. _____	<input type="checkbox"/>
14. _____	<input type="checkbox"/>	28. _____	<input type="checkbox"/>
15. _____	<input type="checkbox"/>	29. _____	<input type="checkbox"/>
16. _____	<input type="checkbox"/>	30. _____	<input type="checkbox"/>
17. _____	<input type="checkbox"/>	31. _____	<input type="checkbox"/>
18. _____	<input type="checkbox"/>	32. _____	<input type="checkbox"/>
19. _____	<input type="checkbox"/>	33. _____	<input type="checkbox"/>
20. _____	<input type="checkbox"/>	34. _____	<input type="checkbox"/>
35. _____		<input type="checkbox"/>	

OPINION (NO SCORE)

1. _____
2. _____
3. _____

TOTAL SCORE ☐

The new 1967 National Drivers Test is produced by CBS News, with the cooperation of the National Safety Council, under sponsorship of Shell Oil Company.



This Official Test Form is printed for your convenience in marking down your answers, totaling your score and comparing it with that of your family and friends.

Be sure to save it for the new 1967 National Drivers Test on Tuesday, May 23rd, on the CBS Television Network. Check your local newspaper for exact time and station.

DEATHS FROM OVERTURNING FARM TRACTORS . . . THE TOLL CONTINUES

---California Safety News,
September 1966

Unsafe practices of operators and lack of safety devices continue to make many agricultural tractors vehicles of injury and death. Overturning farm tractors caused the death of 11 California workers during 1965.

It points up the need for proper instruction on safe practices in the use of tractors and for installation and use of effective safety devices--roll bars and safety belts.

An article in the December 1962 issue of the "California Safety News" discussed the tragic toll from farm tractors. We quote a few sentences from it:

"There is no doubt that a roll bar or canopy would give the operator a far better chance of escaping injury or death if a tractor overturns into an irrigation ditch or canal. "

"There is also no doubt that unsafe work practices are at the root of most overturning farm tractor accidents. "

"We invite tipovers if we hitch loads above the drawbar, or pull too heavy a load uphill, or drive too fast on rough ground or while making a turn. "

"We invite trouble if we use a tractor at excessive speed. A tractor is not designed for fast travel. "

Here are facts relating to some of the 11 deaths in 1965 caused by overturning farm tractors.

A 16-year-old boy, working as a fruit checker in a peach orchard, was sent out with a rubber-tired tractor to pick up empty peach boxes. He was driving too fast, other workers reported later. When he did not return in due time, a worker was sent to look for him, and found him crushed under the overturned tractor in a ditch at the end of the field. The tractor was not equipped with a canopy or seat belts.

A ranch foreman was cutting grass in an avocado orchard with a mower pulled by a small tractor. When he backed the vehicle to make a tight turn near the edge of the orchard, the wheels spun on a 3-foot bank next to the road to the ranch house, and the tractor overturned, crushing the driver under the right front fender and wheel. Seat belts and roll bars probably would have saved his life.

A tractor driver, in an attempt to help remove a fuel trailer stuck in the mud, drove to the back of the trailer to push it. The ground was very slippery; and when he applied power, the front end of the tractor rode up the back of the trailer. The tractor flipped over backward and crushed the driver beneath the steering wheel. Seat belts and roll bars would probably have saved his life.

A ranch caretaker lost control of a caterpillar-type tractor on a ranch road and drove over the edge of the road. One tread dug into the soft dirt of the bank, and the vehicle overturned. The driver was thrown out and landed at the bottom of the embankment, the tractor coming down on top of him. The vehicle had neither seat belts nor roll bars.

A farm laborer, plowing a field with a spring-tooth plow behind a tractor, speeded up and down the rows in fifth gear, using the turning brake (at the end of each row) to effect faster and sharper turns. Making sharper turns allowed him to plow the row beside the one he had just finished, rather than plowing alternate rows. On one of the turns, he apparently misjudged his distance, and crossed a 20-foot-wide dirt road at the end of the field. With one wheel already over the embankment of a shallow slough, he tried to turn, and the tractor overturned. He was pinned beneath the tractor in the slough and drowned in the mud. The vehicle was not equipped with a canopy or roll bars.

A tractor driver who had been raking hay was found crushed beneath the seat of the tractor which had overturned. The hillside was too steep for the small tractor with its heavy hay rake. The vehicle had neither seat belts nor roll bars.

A farm tractor driver pulled a tank truck trailer loaded with 600 gallons of weed oil behind a 4-wheel tractor while a helper sprayed weeds beside a shallow drainage ditch. The operator drove too close to the bank, and the trailer slid into the ditch, overturning the tractor. With the helper unable to pull him out, the driver drowned in two feet of water before a tow-truck could free him. There were no seat belts or roll bars on the tractor.

THE BUREAU OF RECLAMATION REQUIRES ANTI-ROLL BARS AND SEAT BELTS ON ALL FARM-TYPE TRACTORS.

Shown on the opposite page (top) is an International farm-type tractor with front-end loader and backhoe attachments fitted with "on-the-job constructed" anti-roll bars in use by operation and maintenance forces on the Weber Basin Project in Utah. The bottom photograph shows the left rear quarter view of "on-the-job constructed" anti-roll bars on an International farm-type tractor.



P526-412-11077 NA



P526-412-11078 NA

* * * * *

CURRENT CONSTRUCTION SAFETY FILMS AVAILABLE

Safety With Nets, 16mm, color, sound, 12 minutes

Depicts ways of providing fall protection through use of safety nets on high rise structures. (Steel erection Cape Canaveral (Kennedy)--good for this type construction work.)

For availability inquire of Safety Office, Department of the Army, Office of the Chief of Engineers, Washington, D.C. 20314.

Cowboy Kelly's Last Ride, 16mm, color, sound, 16 minutes

Depicts an overzealous shovel operator and some of the damage he does; also subsequent results of damage to underground utilities. (Backhoe disturbing utilities, causing all kinds of trouble, preplanning would have prevented. Good for type of work showing various utilities involved and affected.)

For availability inquire of Northern Illinois Gas Company, P. O. Box 190, Aurora, Illinois 60507.

Watch the Wires, 16mm, color, sound, 13 minutes

Shows hazards of working with shovels, cranes, and other equipment near overhead electrical conductors. (Good demonstration of equipment brought into contact with electric lines, damage caused, need for grounds, etc.)

For availability inquire of Detroit Edison Company, 2000 Second Avenue, Detroit, Michigan 48226.

Bridging the Gap, 16mm, color, sound, 21 minutes

Shows the safe use of road construction equipment on the job and traffic control. (Highway construction but practically all on safety--good for any work group.)

For availability inquire of Ohio Contractors Association, 50 N. Third Street, Columbus, Ohio 43215.

Men of Iron, 16mm, color, sound, 30 minutes

Features an apprentice ironworker and his safety education as he advances from helper to journeyman. Emphasizes success of safety program dependent upon top management participation.

For availability inquire of Construction Safety Associations of Ontario, 74 Victoria Street, Toronto 1, Ontario, Canada.

Before the Blast, 16mm, color, sound, 10 minutes

Covers rules and suggestions concerning the storage, transportation, and use of explosives.

For availability inquire of Aetna Life Affiliated Companies, Information and Education Department, 151 Farmington Avenue, Hartford, Connecticut 06115, or their nearest engineering department office.

* * * * *

NATIONAL SAFETY COUNCIL DATA SHEETS

The National Safety Council has recently published new or revised technical data sheets on the subjects listed below. Copies of these data sheets (by the numbers shown in parentheses) may be obtained from the National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611.

Electric Cords and Fittings (385)
Mounting Heavy-Duty Tires and Rims (411)
Underground Belt Conveyors (447 Revised)
Jet Engine Noise (580)
Silicon Diode Grounding Devices (581)
Secondary Breaking of Rock in Quarries (586)
Tractor Operation and Anti-Roll Bars (587)
Fire Brigades (588)
Front-End Loaders (589)
Handling Liquid Sulfur (592)
Tractor Operation and Protective Frames (594)
Floor Mats and Runners (595)

* * * * *

NEW USA STANDARD FOR EXPLOSIVE-ACTUATED TOOLS

The new standards for explosive-actuated fastening tools apply to tools or machines which, actuated by explosives or any similar means, propel a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object. Design requirements cover high velocity tools, low velocity piston tools, and hammer-operated piston tools.

For a copy of the complete standard, write: United States of America Standards Institute, 10 E. 40th Street, New York, N. Y. 10016, for the USA Standard Safety Requirements for Explosive-Actuated Tools, A10.3-1966. Price is \$2.00 per copy.

OFF-THE-JOB SAFETY

SAFETY RULES FOR LAWN MOWER USE

The rotary mower has become a major instrument for painful injury and even death in this country. Because it has proven to be an efficient and easy-to-use device for cutting grass on both large and small lawns, its success has been phenomenal. About 4 million mowers have been purchased in each of the past 5 years and more than 26 million units are now in use.

Public health officials estimate that 100,000 persons now are injured by lawn mowers throughout the nation each year. Most of the victims are children under 15. More than half of all mower injuries are to hands and feet and result from direct contact with whirling blades. Injuries to other parts of the body occur when stones, nails, or other pieces of metal are thrown by the mower blades--and these can have the impact of a 22-calibre bullet--and plough deeply into flesh and bone.

You can avoid lawn mower accidents by observing these safety rules.

1. Learn your mower and its controls thoroughly; study the instructions carefully and stick by the guidelines set down by the manufacturer.
2. Make sure the lawn is clear of any objects which could be thrown by the blade.
3. Keep children, pets and others away from the mowing area. (Pieces of wood and metal have inflicted eye injuries after being thrown some 70 to 80 feet.)
4. Fill the fuel tank before starting and never refuel a hot or running engine.
5. Start the mower only where your footing is firm and the machine will be stable while you're adjusting its speed. Never use any mower where grass is wet.
6. Stop engine or disengage blade clutch before pushing mower across walks, roads, curbs, gas or water valves or any object that might be above ground level. Be wary of holes or depressions that could allow a wheel to drop, putting the blade in contact with the ground.
7. Stop the engine whenever the mower is left, even for a second.

8. Do not permit children or inexperienced persons to operate the mower.

9. Never cut grass by pulling the mower toward the operator.

10. Never attempt to clear blades or work on a mower until it is shut off and the spark wire is disconnected.

11. If you must work on the underside of a mower, first remove the spark plug after disconnecting it. So long as the spark plug remains installed, an engine can always fire one more time.

* * * * *

POISON IN THE BACK YARD

More than 700 species of plants are known to have caused illness or death -- some of them so common they may be growing right in your own home or garden. Many are lovely to look at and so well known it is hard to believe they are dangerous.

There is no reason to stop growing beautiful flowers and plants because they contain poison, just keep them out of your mouth. Train children not to chew on anything other than known foods, no matter how familiar it appears. Keep a close watch on the little ones in the hand-to-mouth stage. Remember too, adults are not immune to unconscious nibbling.

You may have hyacinths, narcissus or daffodils in your home or yard. Poison from the bulbs causes nausea, vomiting and diarrhea and can be fatal. Attractively striped "dumb cane" and the familiar "elephant ears" both contain crystals of calcium oxalate which cause painful swelling of the mouth and tongue severe enough to close off the air passages of the throat. One leaf of the flamboyant poinsettia can kill a child.

There is enough poison in a ten cent packet of castor bean seeds to kill five children. One rosary pea seed can be lethal. Christmas greens may look good enough to eat, but mistletoe, holly, yew, and Jerusalem cherry can cause serious discomfort.

Twigs of cherry trees release cyanide when eaten. Peach tree leaves contain hydrocyanic acid, one of the most dangerous poisons known.

If someone does ingest a dangerous plant, call a physician immediately for his advice. It is not always advisable to induce vomiting for some plants contain corrosive juices that could severely damage tissue of the digestive tract during vomiting.

COMMON POISONOUS PLANTS

HOUSE PLANTS

Plant	Toxic Part	Symptoms
Hyacinth, Narcissus, Daffodil	Bulbs	Nausea, vomiting, diarrhea. May be fatal.
Oleander	Leaves, Branches	Extremely poisonous. Affects the heart, produces severe digestive upset and has caused death.
Poinsettia	Leaves	Fatal. One leaf can kill a child.
Dieffenbachia (Dumb cane) Elephant ear	All parts	Intense burning and irritation of the mouth and tongue. Death can occur if base of the tongue swells enough to block the air passage of the throat.
Rosary pea, Castor bean	Seeds	Fatal. A single rosary pea seed has caused death. One or two castor bean seeds are near the lethal dose for adults.
Mistletoe	Berries	Fatal. Both children and adults have died from eating the berries.

FLOWER GARDEN PLANTS

Larkspur	Young plant, Seeds	Digestive upset, nervous excitement, depression. May be fatal.
Monkshood	Fleshy roots	Digestive upset and nervous excitement.
Autumn crocus, Star-of-Bethlehem	Bulbs	Vomiting and nervous excitement.
Lily-of-the-valley	Leaves, Flowers	Irregular heart beat and pulse, usually accompanied by digestive upset and mental confusion.
Iris	Underground stems	Severe, but not usually serious, digestive upset.
Foxglove	Leaves	One of the sources of the drug digitalis, used to stimulate the heart. In large amounts, the active principles cause dangerously irregular heartbeat and pulse, usually digestive upset and mental confusion. May be fatal.
Bleeding heart (Dutchman's breeches)	Foliage, Roots	May be poisonous in large amounts. Has proved fatal to cattle.

VEGETABLE GARDEN PLANTS

Rhubarb	Leaf blade	Fatal. Large amounts of raw or cooked leaves can cause convulsions, coma, followed rapidly by death.
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ORNAMENTAL PLANTS

Daphne	Berries	Fatal. A few berries can kill a child.
Wisteria	Seeds, Pods	Mild to severe digestive upset. Many children are poisoned by this plant.
Golden chain	Bean-like capsules in which the seeds are suspended	Severe poisoning. Excitement, staggering, convulsions and coma. May be fatal.

Plant	Toxic Part	Symptoms
Laurels, Rhododendron, Azaleas	All parts	Fatal. Produces nausea and vomiting, depression, difficult breathing, prostration and coma.
Jessamine	Berries	Fatal. Digestive disturbance and nervous symptoms.
Lantana camara (red sage)	Green berries	Fatal. Affects lungs, kidneys, heart and nervous system. Grows in the southern U.S. and in moderate climates.
Yew	Berries, Foliage	Fatal. Foliage more toxic than berries. Death is usually sudden without warning symptoms.

TREES AND SHRUBS

Wild and cultivated cherries	Twigs, Foliage	Fatal. Contains a compound that releases cyanide when eaten. Gasping, excitement, and prostration are common symptoms that often appear within minutes.
Oaks	Foliage, Acorns	Affects kidneys gradually. Symptoms appear only after several days or weeks. Takes a large amount for poisoning. Children should not be allowed to chew on acorns.
Elderberry	Shoots, Leaves, Bark	Children have been poisoned by using pieces of the pithy stems for blowguns. Nausea and digestive upset.
Black locust	Bark, sprouts, foliage	Children have suffered nausea, weakness and depression after chewing the bark and seeds.

PLANTS IN WOODED AREAS

Jack-in-the-pulpit	All parts, especially roots	Like dumb cane, contains small needle-like crystals of calcium oxalate that cause intense irritation and burning of the mouth and tongue.
Moonseed	Berries	Blue, purple color, resembling wild grapes. Contains a single seed. (True wild grapes contain several small seeds.) May be fatal.
Mayapple	Apple, foliage, roots	Contains at least 16 active toxic principles, primarily in the roots. Children often eat the apple with no ill effects, but several apples may cause diarrhea.

PLANTS IN SWAMP OR MOIST AREAS

Water hemlock	All parts	Fatal. Violent and painful convulsions. A number of people have died from hemlock.
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PLANTS IN FIELDS

Buttercups	All parts	Irritant juices may severely injure the digestive system.
Nightshade	All parts, especially the unripe berry	Fatal. Intense digestive disturbances and nervous symptoms.
Poison hemlock	All parts	Fatal. Resembles a large wild carrot. Used in ancient Greece to kill condemned prisoners.
Jimson weed (thorn apple)	All parts	Abnormal thirst, distorted sight, delirium, incoherence and coma. Common cause of poisoning. Has proved fatal.

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

1st QUARTER 1967.

PERIOD FROM JANUARY 1, 1967.. THROUGH....March 31., 1967...

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR			
Washington Office	345	172,368					
Denver Office	1,420	717,616					
Alaska District	42	21,668	1		10	46.2	462
REGION 1							
Boise Regional Office	184	78,189					
Baker Project	32	13,821					
Central Snake	38	17,844					
Chief Joseph Dam	36	17,209					
Columbia Basin Project	876	448,832	2			4.5	56
Grand Coulee Third Powerplant	75	23,172	2		185	86.3	7,984
Green Springs Powerplant	2	924					
Hungry Horse Project	51	26,520					
Lower Columbia Development Office	44	22,825					
Mann Creek Project	20	9,015					
Minidoka Project	65	34,137					
Snake River Development Office	50	25,013					
Spokane Valley Project	21	12,552					
Upper Columbia Development Office	45	21,005					
Yakima Project	30	13,620	1		30	73.4	2,203
Totals & Averages	1,571	765,083	5		240	6.5	314
REGION 2							
Sacramento Regional Office	574	305,634					
Regional Drill Crew	31	15,496					
Auburn-Eolsom South Unit	69	32,136					
Cachuma Operations Field Branch	2	1,024					
Central Coast Dev. Field Branch	5	2,481					
Folsom Field Division	66	34,659					
Fresno CVP Construction Office	109	51,740					
Fresno Field Division	140	71,048					
Klamath Project Office	17	8,360					
Lahontan Basin Projects Office	34	17,712					
Napa Development Field Branch	6	3,072					
Red Bluff CVP Construction Office	66	34,408					
Reno Transmission Lines Office	29	15,051					
San Luis Unit CVP Construction Office	434	222,928	1		18	4.5	81
Shasta Field Division	126	65,680					
Solano Operations Field Branch	2	1,024					
Tracy Field Division	167	86,405					
Upper North Coast Dev. Field Branch	4	2,048					
Willows CVP Construction Office	110	56,936					
Totals & Averages	1,991	1,027,842	1		18	1.0	18
REGION 3							
Boulder City Regional Office	143	68,320					
Boulder Canyon Projects Office	140	69,003	1		45	14.5	652
Boulder City Development Office	31	15,528					
Dixie Project Office	24	14,429					
Lower Colorado River Control Office	24	11,380					
Needles Field Division	50	22,531	1		18	44.4	799
Palo Verde Field Division	17	7,978					
Cibola Field Division	93	45,596	1		90	21.9	1,974
Laguna Field Division	19	8,916					
Mead Construction Office	21	7,976					
Parker-Davis Project	314	151,602	2		95	13.2	627
Phoenix Development Office	87	40,976					
Southern California Dev. Office	35	17,872					
Yuma Projects Office	156	74,880					
Totals & Averages	1,156	556,987	5		248	9.0	445
REGION 4							
Salt Lake City Regional Office	260	115,422					
Central Utah Project	152	76,353					
Curecanti Unit	149	71,959					
CRSP Power Operations Office	293	152,808					
Durango Projects Office	29	13,501					
Grand Junction Projects Office	78	40,288					
Logan Development Office	11	5,720					
Lyman Project	25	12,000					
Seedskadee Project	26	13,897					
Upper Green River Development Office	7	3,640					
Weber Basin Project O.	74	41,008					
Totals & Averages	1,104	546,596					
REGION 5							
Amarillo Regional Office	111	63,842					
Albuquerque Development Office	34	16,602					
Arbuckle Project	16	7,892					
Austin Development Office	49	24,864					
Canadian River Project	83	42,450					
Lower Rio Grande Project	2	1,008					
Middle Rio Grande Project	215	103,109					
Navajo Project	88	46,334					
Oklahoma City Development Office	21	9,308					
Pecos River Water Salvage Project	3	480					
Rio Grande Project	223	103,924	2		42	19.2	404
San Juan-Chama Project	77	35,672					
Totals & Averages	922	455,485	2		42	4.4	92
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT
GOVERNMENT FORCES

1st QUARTER, 1967.

PERIOD FROM JANUARY 1, 1967 THROUGH March 31, 1967

[illegible]

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD
CUMULATIVE QUARTERLY REPORT
CONTRACTOR FORCES

1st QUARTER, 1967

PERIOD FROM JANUARY 1, 1967... THROUGH March 31, 1967...

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR FATAL #			
DENVER OFFICE		9,512					
REGION 1							
Baker Project	71	17,601					
Chief Joseph Dam	48	23,394	1		15	42.7	641
Columbia Basin Project	265	81,302	2		17	24.6	209
Mann Creek Project	61	19,247					
Minidoka Project	8	893					
Spokane Valley Project	13	2,408					
Yakima Project	28	3,602					
Totals & Averages	494	148,447	3		32	20.2	216
REGION 2							
Presno CVP Construction Office	95	23,979					
Presno Field Division		3,164					
Klamath Project Office		1,164					
Lehontan Basin Projects Office	4	6,263					
Red Bluff CVP Construction Office	108	54,144					
Transmission Lines Office, Reno	3	226					
San Luis Unit CVP Construction Off.	1,079	497,779	6		206	12.1	414
Tracy Field Division	6	2,356					
Willows CVP Construction Office	103	31,954	1		4	31.3	125
Totals & Averages	1,398	621,029	7		210	11.3	338
REGION 3							
Cibola Field Division	46	12,030					
Mead Construction Office	79	3,836					
Palo Verde Field Division	26	14,221					
Parker-Davis Project	273	134,539	3		199	22.3	1,479
Totals & Averages	424	164,626	3		199	18.2	1,209
REGION 4							
Central Utah Project	15	824					
Curecanti Unit	373	171,164	3		151	17.5	882
CRSP Power Operations Office	46	19,475					
Durango	7	1,420					
Grand Junction Projects Office	28	15,172					
Seedskadee Project	19	11,515					
Weber Basin	14	3,147					
Totals & Averages	502	222,717	3		151	13.5	678
REGION 5							
Arbuckle Project	11	5,554					
Canadian River Project	73	46,829	2		26	42.7	555
Navajo Project	218	113,231	6		144	53.0	1,272
Pecos River Water Salvage Project	14	2,256					
San Juan-Chama Project	411	232,189	3		460	12.9	1,981
Totals & Averages	727	400,059	11		630	27.5	1,575
REGION 6							
Fort Peck Project	4	586					
Missouri-Osage Projects	8	1,051					
Riverton Project	3	88					
Upper Missouri Projects	53	18,602					
Yellowtail Project	25	10,808					
Totals & Averages	93	31,135					
REGION 7							
Fryman-Arkansas Project	426	226,102	7		91	31.0	402
Kansas River Projects	331	149,543	3	1	6,072	20.1	40,604
Mohrara-Lower Platte Dev. Office	15	2,551					
North Platte River Projects	78	17,566					
Totals & Averages	850	395,762	10	1	6,163	25.3	15,572
CONSOLIDATED TOTALS	4,488	1,932,287	37	1	7,385	18.6	3,705
TOTALS LAST YEAR(1966)	5,162	14,476,443	194	13	98,137	13.4	6,779

*FATALITIES INCLUDED IN TOTAL DISABLING

PREVENT ACCIDENTS

**KNOW THE
WATER SAFETY
RULES**

WEAR LIFE
PRESERVERS
WHEN IN
SMALL BOATS



DON'T
STAND UP
IN BOATS



LEARN HOW
TO SWIM

KNOW
YOUR BOAT
AND MOTOR



ALCOHOL
AND WATER
DON'T MIX



NEVER OVERLOAD
OR OVERPOWER
YOUR BOAT



**PREVENT
DROWNINGS**

BE SURE
OF YOUR
FOOTING
WHEN
WADING



AVOID AREAS
NEAR DAMS



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RECLAMATION SAFETY NEWS



1077WB-400-157

Second Quarter 1967



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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TABLES

Safety Performance Record

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Front Cover Photo: Department of the Interior Certificate of Safety Achievement presented to the Weber Basin Job Corps Conservation Center for outstanding safety record. Personnel participating in the award ceremony held at the Center near Ogden, Utah, on July 25, 1967, are (left to right): Charles Butler, Reclamation Job Corps Coordinator from Washington, D.C., David L. Crandall, Region 4 Regional Director; Center Director Richard A. Ulrich, and Center Safety Officer LaMar Ercanbrack. Bureau of Reclamation Photo 1077WB-400-157. (Also see page 4.)

SAFETY NEWS is published quarterly by the Office of Chief Engineer, Bureau of Reclamation, Denver, Colorado, in the interest of accident prevention.

BUREAU SAFETY PERFORMANCE

1967 CUMULATIVE SAFETY RECORD

January 1 - June 30, 1967

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 4	0.0	0.0	0	2.2
Region 6	0.3	2.5	13	3.5
Region 2	0.4	1.4	25	1.1
Region 7	0.6	1.7	35	2.1
Region 5	1.2	2.1	56	4.6
Region 1	8.2	4.4	187	6.0
Region 3	24.3	6.1	398	2.6
Alaska District	<u>52.9</u>	<u>23.0</u>	<u>230</u>	<u>0.0</u>
Totals to Date	1.9	2.2	86	3.1
Totals 1966	19.9	2.3	864	3.1

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	0.0	0.0	0	0
Region 4	16.4	6.3	261	0
Region 2	23.0	9.3	247	0
Region 1	65.8	23.0	286	0
Region 3	93.9	14.6	643	0
Region 5	611.4	26.4	2,316	0
Region 7	<u>1,206.2</u>	<u>21.8</u>	<u>5,533</u>	<u>1</u>
Totals to Date	316.2	16.1	1,964	1
Totals 1966	908.4	13.4	6,779	13

C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate	2.4
Severity rate	1,238
Vehicle accident rate	22.7

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1967
Second Quarter

Cumulative to Date:
June 30, 1967

A. ACCIDENT CLASSIFICATION

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Water craft	2	257
Vehicles	4	118
Handling materials and equipment	9	351
Falling objects (rock)	1	35
Falls of persons	7	102
Rattlesnake bite	<u>1</u>	<u>52</u>
Totals	24	915

B. OPERATIONAL SUMMARY

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	4,439,197				
Construction	2,058,159	10	588	4.9	286
Investigation	1,081,369	1	4	0.9	4
Power O&M	1,746,441	7	193	4.0	111
Irrigation O&M	<u>1,348,842</u>	<u>6</u>	<u>130</u>	<u>4.4</u>	<u>96</u>
Totals	10,674,008	24	915	2.2	86

* * * * *

DAM IN WEST JAVA TAKES BIG TOLL OF WORKERS

About 2,100 workers have been killed in accidents on a French-Indonesian dam project in West Java in the past 6 years, Indonesian newsmen recently reported after a visit to the damsite.

The newsmen were told that 27,000 workers have been injured on the project, which is employing about 150,000 workers. Shortly before the newsmen arrived, another tractor driver plunged to his death in the lake waters.

* * * * *

SAFETY AWARDS

DEPARTMENT OF THE INTERIOR CERTIFICATE OF SAFETY ACHIEVEMENT



Project Manager E. A. Lundberg (right), Missouri-Souris Projects Office, Bismarck, North Dakota, receives the Department's Certificate of Safety Achievement from John A. McDonald, Administrative Office and Chairman of the Safety Committee. The award recognizes 2,000,000 miles of accident-free driving by employees of the Missouri-Souris Projects Office during the period March 25, 1964, to September 18, 1966. The office has now accumulated an additional 500,000 accident-free miles for a total of 2,500,000 through May 26, 1967.

WEBER BASIN JOB CORPS CONSERVATION CENTER RECEIVES SAFETY AWARD

A Department of the Interior award for an outstanding safety record was presented to the Weber Basin Job Corps Conservation Center on July 25, 1967, by Regional Director David L. Crandall, Region 4, Bureau of Reclamation. The award recognizes 1,131,600 working hours during calendar year 1966 without a lost-time accident by corpsmen and staff. This is the first such award earned by a Job Corps Conservation Center.

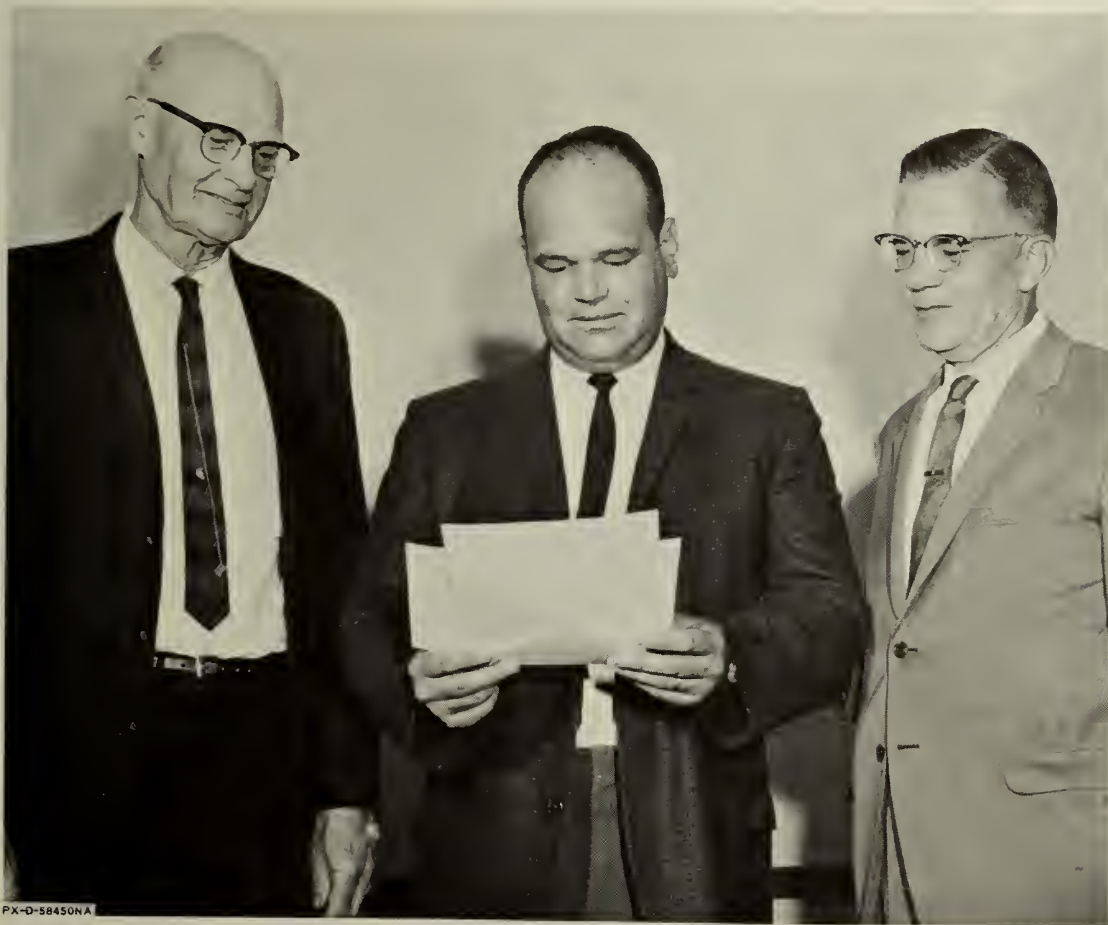
"The award is especially significant since these young men are learning skills with previously unfamiliar tools and equipment," Mr. Crandall said. "Daily safety meetings to pinpoint each hazard must be credited for the fine record achieved." Work programs of the Weber Basin Job Corps Center are designed not only to educate the corpsmen, but also to improve recreation facilities on Weber Basin Project reservoirs. The young men have been engaged in clearing brush, building picnic shelters, rest rooms, fireplaces, water systems, and improving trails and roads.

Among those participating in the award ceremony, as shown in the photograph below, are: Center Safety Officer LaMar Ercanbrack, holding the award, with Center Director Richard A. Ulrich on his right; flanking these two are (left to right) Dormitory Presidents Scott, Evans, Ritchie, and Sarmiento. (Also see front cover.)



SPECIAL ACT AWARDS

Regional Director R. J. Pafford presented \$500 Special Act Awards to Safety Officers Larry J. Thomas and Thomas G. Skordas during a special meeting in Sacramento on July 6, 1967.



Shown above (left to right): Project Construction Engineer M. R. Johnson, Los Banos, California; L. J. Thomas, Safety Officer, Los Banos; Regional Director R. J. Pafford, Jr.

Project Construction Engineer M. R. Johnson cited Mr. Thomas' outstanding performance in preparing session outlines for The Associated General Contractors' Safety Training Course. The 15 chapter outlines which he prepared for the course cover the subject material in an effective and logical manner. He also obtained more than 400 35-mm slides for use in these sessions.

CONSTRUCTION SAFETY AWARD

United Nations Constructors, Inc., earns the Construction Safety Award for the outstanding safety record achieved while performing work under Specifications No. DC-6359. The Santa Monica firm commenced construction of the Colusa County Water District Distribution System, Unit 1B, in February of 1966 and completed all work 1 year later without experiencing a lost-time injury.



H. E. Horton, Project Construction Engineer for the Bureau of Reclamation at Willows, California, is shown above presenting Reclamation's Construction Safety Award to Charles C. Dirik, Project Manager for United Nations Constructors, Inc.

Two Construction Safety Awards were recently presented to contractors on the Spokane Valley Project, Spokane, Washington.

The Lester N. Johnson Company logged 114,903 hours during the period June 18, 1965, to April 7, 1967, without experiencing a single disabling injury. Pictured below at the presentation ceremony are, left to right: C. R. Murphy, Bureau's Project Safety Officer; Lester N. Johnson, Partner, Lester N. Johnson Company; E. J. Brannan, Bureau's Project Construction Engineer; Howard V. Munday, Inspector, Department of Labor and Industries, State of Washington; and Dennis L. Johnson, Partner, Lester N. Johnson Company.



Nelson-Lydig, Inc., logged 14,181 hours during the period October 1, 1965, to March 1, 1967, without experiencing a single disabling injury. Pictured below at the presentation ceremony are: C. R. Murphy, Safety Officer; Paul T. Lydig, Vice-President, Nelson-Lydig, Inc.; E. J. Brannan, Project Construction Engineer, and Howard V. Munday, Inspector, Department of Labor and Industries, State of Washington.



* * * * *

FROM THE FIELD

Yuma Projects Office, Yuma, Arizona--Eye Injury Avoided: A serious eye injury to an employee was avoided when the lens of his safety glasses withstood the impact of a fragment of metal. The employee was removing a cast iron pipe plug with a 12-inch crescent wrench. As torque was applied, the plug disintegrated with considerable force, with one large fragment striking the left lens of the employee's prescription-ground safety glasses. The lens surface cracked but no glass or splinters were displaced.

On June 19, 1967, employees of the Yuma Projects Office successfully achieved the goal of 1,000 days without a disabling injury. The picture below was taken to commemorate the occasion. Yuma Project Manager T. H. Moser, center, and Safety Officer Bill Barcus watch James B. Chiles, Chief, Maintenance Branch, install numbers on the Project Safety Board.



PX-603-265NA

Folsom Field Division, Folsom, California--Installation of Anti-Roll Bars and Seat Belts: Anti-roll bars, fabricated by field division personnel, and a seat belt were installed on the John Deere front-end loader and backhoe as shown on the photographs below.



Columbia Basin Project, Ephrata, Washington--Electrical Safety: An electrical safety demonstration was presented by Mr. Dan Ratkovich, U.S. Bureau of Mines, Seattle District, to supervisors at Coulee Dam and the pump plant mechanics at Ephrata. The demonstrations were considered enlightening and educational by the 50 Project employees who attended the meetings.

Region 3, Boulder City, Nevada--14th Annual Western Safety Congress: Region 3 Safety Officers from the Parker-Davis Project Office, Yuma Projects Office, Boulder Canyon Project Office, and the Cibola Field Division attended the 14th Annual Western Safety Congress held in Los Angeles on May 23-25, 1967.

South Platte River Projects, Loveland, Colorado--Safe Driver Awards: Project Safety Officer Ted McCormick is shown below presenting Safe Driver Awards to a group of employees headquartered at the Loveland Service Area.



P245-713-3917NA

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WATER SAFETY

North Platte River Projects, Casper, Wyoming: On June 7-9, 1967, Safety Officer Charles H. Saunders attended the Western States Boating Administration Association's 6th Annual Conference at Rock Springs, Wyoming.

South Platte River Projects, Loveland, Colorado: "Operation West-wide" had a busy Month of May with the poster contest sponsored by the Northern Colorado Water Safety Council. About 400 posters were contributed by the students of 11 schools in the area. Trophies were presented to the top three winners in different age groups and certificates were given to the top winners in each group. A program, including a film, was given at each school when the awards were presented. Northern Colorado Water Conservancy District personnel, the Business and Professional Women's Club, Bureau of Reclamation personnel, and others participated in the program. Award winners at Garfield School in Loveland are shown below with their water safety posters.



Columbia Basin Project, Ephrata, Washington: The Ephrata Water Safety Lyric Contest concluded recently when names of winners were announced at school award assemblies. Approximately 700 students participated in the contest which was aimed toward creating a greater water awareness during the summer season. The contest was sponsored by the Ephrata Safety Council, with donations for cash prizes coming from Ephrata Service clubs. Lyrics will be broadcast throughout the summer as a reminder to the public to stay safety conscious around the water.

RECORD OF PUBLIC DROWNINGS

	<u>1-1-67 to 6-30-67</u>	<u>CY66</u>	<u>CY65</u>
<u>Bureau-operated Facilities:</u>			
Canals	6	14	22
Dams	0	0	0
Reservoirs	3	1	3
Total	<u>9</u>	<u>15</u>	<u>25</u>
<u>Facilities Operated by Others:</u>			
Irrigation and Water Districts	5	15	14
State or County (Recreational)	15	19	39
Total	<u>20</u>	<u>34</u>	<u>53</u>
<u>Summary of Total Drownings During Period:</u>			
By Operating Agency:			
Bureau of Reclamation	9	15	25
Irrigation and Water Districts	5	15	14
State or County (Recreational)	15	19	39
Total	<u>29</u>	<u>49</u>	<u>78</u>
By Type of Facility:			
Canals	11	27	34
Dams	1	0	0
Reservoirs	17	22	44
Total	<u>29</u>	<u>49</u>	<u>78</u>
By Activity:			
Swimming	7	15	23
Boating	6	6	14
Fishing	0	2	7
Fell into water	9	19	24
Other	7	7	10
Total	<u>29</u>	<u>49</u>	<u>78</u>
By Age:			
Under 12 years of age	6	19	19
From 12 to 25	7	12	22
From 25 to 50	12	10	23
Over 50 years of age	4	8	14
Total	<u>29</u>	<u>49</u>	<u>78</u>

R E C R E A T I O N

RIVER RUNNING BELOW GLEN CANYON DAM BECOMING HIGHLY POPULAR

River running through the Grand Canyon of the Colorado River has greatly increased since the construction of Glen Canyon Dam, according to figures released today by the Department of the Interior.

The figures show that in 1962, the last year before Glen Canyon Dam regulated the flows of the Colorado River, only 362 persons floated through the deep and spectacular Marble and Grand Canyons. In 1966, over a thousand boaters took the scenic, white water voyage. The National Park Service at Grand Canyon anticipates that this year over 2,000 people will make the float trip on rubber rafts.

"Glen Canyon Dam has extended the river running season from a few weeks in spring and early summer to a year-around sport," Commissioner of Reclamation Floyd E. Dominy said. "Before we built Glen Canyon Dam boaters could expect to find enough water in the river only during the snow-melt season. Now, with regulated releases through the Glen Canyon powerplant, there is ample water for river running at any season of the year."

To help river runners adapt to the regulated flow of the Colorado River below the dam, the Bureau of Reclamation has prepared a short printed analysis of typical daily fluctuations in water releases from the Glen Canyon Powerplant. The pamphlet, entitled "River Boating Below Glen Canyon Dam," shows times for maximum and minimum flows, and, by graphs, enables river runners to predict when the higher flows will reach any point in Marble or Grand Canyons. By using the folder a boatman will know when it is best to make camp for the day as well as when to leave the next morning; he can pace his voyage to take advantage of the best river flows.

The pamphlet guide is available at Bureau of Reclamation or National Park Service offices in Page, Grand Canyon, Boulder City, or Salt Lake City. Boaters may also pick up copies at Lees Ferry, the point of embarkation for river voyages.

Mr. Dominy added the cautionary note that boating in Grand Canyon is still dangerous, and that a permit is required from the National Park Service at Grand Canyon National Park before boating parties are launched at Lees Ferry. Names of well qualified commercial river guides are available upon request. The boat trip generally takes from 8 to 12 days.

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REMARKS BY
HOWARD S. LATHAM, CHIEF SAFETY ENGINEER
BUREAU OF RECLAMATION
U.S. DEPARTMENT OF THE INTERIOR
AT THE JAMES D. MARSHALL TRAINING CONFERENCE
SPONSORED BY
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA
WASHINGTON, D.C. MAY 15, 1967

IT'S TIME TO RE-EVALUATE OUR SAFETY EFFORT

I'm most appreciative to have this opportunity to meet with you and to discuss safety in the construction industry. Reclamation is responsible for the administration of a public works program involving an expenditure of 300 million dollars annually for development of water resources and hydropower for the West. We are proud of the fact that almost 100% of this construction is performed by private contractors on a competitive bid basis -- Also that approximately 90% of the costs of the projects built by Reclamation are repaid to the Federal Government, most with interest.

As a result of this close relationship with the contractors and the associations representing them, we share many of the problems as well as the public criticism and indictments which are often leveled against the industry. A persistent criticism of the construction industry has been its poor accident record. Year after year the industry suffers one of the highest injury rates, claiming an average of 2,600 lives and contributing to over 200,000 disabling injuries annually.

As contractor representatives, I know you must be concerned with this problem which plagues the industry and causes embarrassment. You are certainly aware of the inroads made on profits by reason of the direct cost of workmen's compensation insurance, the loss of equipment and material, unscheduled delays, together with the loss of production and efficiency. With the full realization of the fact that the increased expense resulting from poor safety records is passed on to the owner in increased building costs, reflected in higher bids -- Reclamation is concerned. Compounding this is the increasing number of tort claims being brought against the Government on the allegation that the Federal Agencies failed to provide a safe work environment and were negligent in the enforcement of safety standards. As a result, we're both being "tarred with the same brush" -- economically and reputation-wise.

You doubt it? Let me quote a passage from the current edition of the Lawyers Desk Reference, authored by Dean Robb and Harry Philo, both prominent and influential claims attorneys: "Construction

safety in the United States today is almost wholly dependent upon the philosophy, competence and will of the safety personnel of the United States Army Corps of Engineers and the Bureau of Reclamation. The Northwest Division of the Corps of Engineers, headquartered in Portland, Oregon, is the only District that appears to have all three. The time which the Bureau of Reclamation spends rationalizing negligent conduct could much better be spent saving lives by insisting on Government contractors with safe equipment, competent safety personnel, and adequate safety programs, and by developing safe systems of work and safe design of machinery and equipment. Such an approach would probably save the lives of ten thousand workers and prevent injury to one million in the next ten years."

Obviously, the allegation is irresponsible and completely erroneous, based upon exaggerations and half truths. It's erroneous because Reclamation contractors are enjoying comparatively good accident records -- the average accident frequency rate over the past 3 years is 13.4, which is less than half the current industry-wide average. Also, Reclamation has pioneered in the establishment of progressive--and practical--construction safety standards: Bureau contractors can--and often do--attest to the aggressive efforts of our safety and inspection personnel in attempting to insure compliance with these standards. Grossly exaggerated is the inference that Reclamation controls a preponderance of the Nation's construction, and that construction safety in the United States is largely dependent upon our philosophy, competence, and will. Reclamation's \$300 million annual construction expenditure, while important, is only a fraction of the Nation's total annual construction expenditure of \$50 billion plus. Likewise our average construction accident rate over the past 10 years amounted to 11 fatalities and 300 disabling injuries a year. However, Robb and Philo appear to be convinced that the tail should wag the dog.

Discounting the indictment that the construction industry and those associated with it are disposed to be complacent and irresponsible in their safety efforts, there is reason to be genuinely concerned with the current accident record in the industry. And it is sobering to realize that the statistics reflect loss of life, injuries, waste, inefficiency and delay.

Let's face it -- we are all involved: Contractors, Labor, the owners, and Government. And, even from the most tolerant appraisal of the record, it is evident that greater emphasis must be placed upon improving the safety record in construction. While the industry is not negligent as charged, it is evident that many of us have not worked hard enough to improve the safety record. Further, our efforts -- regardless of their sincerity -- have often been misdirected or ineffective.

Our immediate objective should be to stimulate new and more vigorous action at all levels toward a more constructive approach to safety in construction. The contractors and contractor associations should spearhead these efforts--since they have the means and are most affected by the success or failure of these efforts. With this in mind, I would like to share some of the concepts of effective safety management incorporated in the Bureau of Reclamation's construction program.

Primarily, we desire contractors who believe and indicate by their actions that safety is an integral part of the work--are convinced that safety is sound economy--and, as a result, take the initiative in formulating and conducting an aggressive safety program. This is based upon the premise that it is their industry, their employees, their insurance premiums, their financial gain or loss -- and primarily their legal and moral responsibility.

However, there are specific provisions incorporated in all Reclamation contract specifications which we consider essential to an effective contractor safety effort. Since you are familiar with the essential criteria for an effective safety effort, I'll merely summarize them.

Establishment of a bona fide safety program embodying company policy and incorporating specific safety requirements pertaining to all work engaged in by the firm. I want to emphasize that no safety program is worth the paper it is printed on unless top management gives it full backing and line supervisors are made to understand the importance of getting workers to comply with the safety requirements.

Provision should be made for responsible and competent safety supervision--either a career safety engineer or designation of a key supervisor--depending upon the size and nature of the job.

Provision for adequate first-aid and medical facilities, together with trained personnel to provide prompt and efficient first-aid and medical attention for injured employees. Every foreman should be required to possess either a U.S. Bureau of Mines or American Red Cross first-aid certificate.

Provision for continuing safety education at all supervisory and operational levels. This educational program must, as a minimum, provide for monthly supervisory safety meetings and weekly tool-box safety meetings conducted by the foremen and attended by every workman on the job.

Probably the most pressing need is for an effective safety training program for construction supervisors--foremen and superintendents. The Associated General Contractors of America have attempted to meet this

need through the development of a "Safety Training Course for Construction Supervisors." This training fills a need of long standing in the construction industry. While a commendable start has been made, I don't believe the AGC nor the contractors have tapped the full potential of this course. It is not enough to train key supervisors at Chapter headquarters. This essential safety education program should be expanded and made available to all contractor supervisors including craft foremen and general foremen on all construction jobs. Reclamation is sold on the AGC course to the extent that we require every construction inspector to complete this training. To date over 900 construction inspectors have completed the course, conducted on the various jobsites.

Acceptance and compliance with established health and safety standards. These safety standards, relating to construction activity, are encountered in various forms. There are State safety orders constituting a legal obligation on the part of the contractor for compliance -- and, incidentally, this obligation applies to contractors doing work for Reclamation. Several Government agencies, including Reclamation, incorporate safety standards in their contract specifications: These represent a contractual obligation on the part of the contractor for compliance. Safety standards pertaining to construction are also available from: The United States of America Standards Institute-- who are presently revising and enlarging the AIO Code covering construction--The Associated General Contractors of America, and the National Safety Council.

I'd like to make one more comment about safety standards for the construction industry. I've heard contractors gripe or complain about State and Federal agency safety standards -- "They are too stringent, impractical, not applicable, and so forth." I've been guilty of this myself, and there is probably considerable truth in many of these complaints.

However, there is a solution to this--too seldom exercised by contractors. Contractors should take the time and expend the effort to participate in the formulation of these standards. Participation is available through contractor associations, the Construction Section of the National Safety Council, the United States of America Standards Institute, and at review hearings called by the various State Industrial Commissions. While such participation requires time and effort, it is essential if construction safety standards are to reflect the needs and desires of the industry. -- There's an old saying: "If you can't beat them, join them." I'd suggest you join.

I'd like to leave one last thought for your consideration -- LET'S START BY PREVENTING THE ACCIDENTS THAT KILL.

In reviewing the fatalities which occurred on Reclamation construction during the past 3 years we found that 20 of the 24 fatal accidents resulted from the operation of construction equipment. Rubber-tired equipment, scrapers, bottom-dump, and end-dump trucks were involved in 10 of these fatal accidents. Mobile cranes accounted for seven more.

Control equipment accidents, particularly truck and crane accidents, and the construction industry will be well on the way toward achieving a safety record it can live with -- and afford. How?

Design. Increased consideration for the health and safety of the operator and others should be provided in the design of heavy equipment. For example, the failure of the air-braking systems contributed to 4 of the 10 fatalities which involved rubber-tired hauling equipment. Unfortunately, as you know, similar failures occur frequently throughout the industry. Dual or emergency braking systems would have prevented many of these accidents.

Reclamation's revised construction safety standards, presently being reviewed by The Associated General Contractors of America, the Society of Automotive Engineers, equipment manufacturers and others, will require emergency braking systems on all off-highway, pneumatic-tired, earthmoving equipment having a struck capacity of 15 cubic yards or greater, manufactured after January 1, 1968. Additionally, equipment of this type, manufactured after 1965 will be required to be equipped with roll-over bars or canopies and seat belts installed in the cabs for use of the operators. I was personally pleased with the general acceptance of these provisions as indicated by the AGC, the manufacturers of equipment and others. However, I believe that the contractors, through their contractor associations and individually, should insist on these safety features on all new equipment. The industry cannot permit safety to be optional. -- Today the alternative will be to face the wrath of Congress; public ridicule by the Robbs, Philos and Naders; and the censure of your own conscience.

In our evaluation of equipment design, we can't afford to overlook the problem of environmental health. I'm speaking of designing for the elimination or reduction of excessive noise, harmful dusts, and extreme temperatures. I'm personally convinced that air-conditioned cabs on heavy equipment operated in hot climates is not too far in the future. Noise abatement, achieved by relocating exhaust ports or by the installation of sound barriers or absorption material, should be undertaken now. These improvements are necessary and are comparatively inexpensive when compared with the overall cost of equipment. Further, dollars expended in this manner will be returned tenfold in increased production and reduced accident costs.

Maintenance. Preventive maintenance, with provision for tagging and deadlining faulty equipment, is essential to an effective safety effort. -- This is all too often neglected under the dangerous and uneconomical pretense of delaying production.

Operator Qualification and Training. This need is probably the most important and usually the most neglected factor in safe equipment operation. To be effective, both management and labor must participate in this program, involving provision for training new operators, checking out operators when they are hired, insuring that operators are physically qualified, together with provisions for on-the-job safety training and education.

I doubt that any of us entertain any doubt as to the need to re-evaluate our safety effort. Casual reflection will disclose how significant accident experience is in relation to the construction industry: Its affect upon our ability to achieve a quality product--on time--with optimum safety and at a profit.

I've presented a few basic safety concepts absolutely necessary to achievement of a good safety record -- all requiring initiative and the expenditure of time and effort on the part of those in the industry -- And all capable of achievement by any reasonably competent management. Those of us in the construction industry can reaffirm our SKILL, RESPONSIBILITY, AND INTEGRITY by pinpointing these concepts or objectives for accomplishment -- NOW!

In order to emphasize the necessity for action NOW, I'd like to leave you with this quote from an unknown author:

"The Tarantula sat on the Scorpion's back,
And he chuckled with ghoulish glee;
Says he, 'I must lick this son-of-a such,
Or, by gad, he'll lick me.'."

VEHICLE SAFETY

RIGHT OF WAY

---By Clarence L. Richards
Fryingpan-Arkansas Project
Construction Field Division
Salida, Colorado

Not the "right of way" when driving,
but the simple way of right,
And never once forgetting
to be courteous and polite.
A little bit of patience
as behind the wheel you sit,
And you'll never lose a fender,
and a child you'll never hit.

Oh, the worst of phrases singing
all through motordrome day,
Is that selfish bit of wording
that is known as "right of way."
It has filled the graves of many
who have sped some road along--
Since death never asks the question,
is the driver "right" or "wrong."

Just a little thought for others--
just remembering to be kind;
Just the willingness in traffic
to slow down and stay behind;
Just a show of gracious manners,
which all gentle folks display,
And the accidents that happen
will be fewer day by day.

Just control that flash of temper
when another sounds his horn.
In the car may be a mother
soon to have her baby born.
Be considerate in your driving,
and be courteous and kind,
And you'll reach your dwelling safely,
and you'll keep your peace of mind.

MAINTAINING TRAFFIC THROUGH HIGHWAY CONSTRUCTION PROJECTS

---E. W. Robbins
American Road Builders Assn.

Every highway construction or maintenance project is a potential hazard. The following checklist has been adapted from Bureau of Public Roads guidelines to minimize hazards and inconvenience to motorists.

1. Traffic control should be an integral part of the project plans and special provisions. Major traffic control devices should be specified.
2. Pre-construction conference:
 - a. All interested parties should agree on a traffic control plan.
 - b. The contractor should submit a list of proposed traffic control devices.
3. Typical items to be considered:
 - a. The contractor should designate a man to be in charge and responsible for the overall traffic control program.
 - b. The contracting agency should also designate one person to be in charge of the traffic control program.
 - c. "Permanent" 24-hour signs should be reflectorized and of the proper mounting height; illumination of certain signs may be desirable.
 - d. Signs used only part time should be fitted with substantial covers and be covered when not required.
 - e. Location of traffic cones, barrels, or other channelizing devices should be marked on the pavement by paint or other methods, so they can be properly reset if they are moved accidentally by traffic, construction activities, or wind.
 - f. If conditions warrant, the contractor should equip one pick-up truck or similar vehicle as a traffic control truck. It should have a rotating amber, cab-top flasher, and carry an assortment of signs and portable barricades needed on the project.

- g. The traffic control truck crew should provide proper signing and protection prior to the beginning of construction activity each day. They should patrol the work area as frequently as needed during the day and at cessation of work for the day, to see that channelization and other traffic control devices are appropriate for the current conditions and that non-applicable signs are covered.
 - h. Flashers should not be used as delineation--here a steady light is preferable. Random flashing is confusing.
 - i. Flashers and/or flags on 24-hour signs are useful in catching a driver's eye.
 - j. Be honest with road users by utilizing "men working" and other signs only during times when men are working, not on Sunday or holidays.
 - k. If traffic volumes permit, placing traffic in a single lane is an effective speed control measure. This prevents passing maneuvers and reduces the speed of fast drivers. The public does not generally complain, as long as they are allowed to keep moving.
 - l. When reducing traffic lanes on high-speed highways, channelizing devices should produce a 100:1 taper. A short observation period will indicate whether the taper is sufficient. When in doubt, increase the length. Adequate advance warning devices should be erected at least one mile ahead of the line reduction with frequent sign displays on both sides of the roadway thereafter.
4. It is essential that the surface of the route to be used by traffic, whether located within the construction area or on a detour, be maintained in a condition that will permit the safe movement of traffic at a reasonable speed, ordinarily at least from 20 to 25 miles per hour.
 5. Flagmen should be stationed at critical points, as needed. Flagmen should be equipped with safety hats and colored vests and be thoroughly instructed in their duties.
 6. Provision should be made to minimize hazards when contractors' trucks and heavy equipment enter or cross the flow of traffic.

7. Truck drivers and heavy equipment operators should be instructed in safety procedures. Only experienced operators should be permitted to operate equipment.
8. All construction equipment should be maintained in safe operating condition.

Proper and adequate traffic controls not only protect the motorist but reduce employee and equipment exposure to traffic hazards.

* * * * *

SEAT BELTS AND DAMAGES COLLECTION

In Wisconsin, two recent court decisions point up what could be a strong incentive for wearing seat belts--the danger of being unable to collect damages for injuries sustained in an accident if failure to wear an available seat belt could be considered a contributing factor in the injuries.

In one case, a 12-member jury in a county court held that the plaintiff was more than half to blame for her own injuries because she neglected to fasten her seat belt. Although the jury awarded her \$15,000 in damages, the judge said that this could be reduced by the percentage of her own culpability.

The plaintiff's husband, who was driving the car in which she was riding--and was also suing for damages--was held blameless in the accident. He, too, was not using his available seatbelt at the time of the accident, but this was held no bar to collection of \$6,000 damages awarded him, since recent abdominal surgery had prevented him from fastening the belt.

In another case, the Wisconsin State Supreme Court decided that failure to use available seat belts could be considered negligence if testimony showed injuries suffered might have been less if belts were worn.

---Traffic Safety
July 1967

PREVENTING EQUIPMENT FROM MOVING WHILE IT IS SERVICED

--J. J. Veatch, Chief, Safety Office
Missouri River Division
Corps of Engineers, Omaha, Nebr.

When heavy earthmoving equipment is brought into a field service area or is stopped adjacent to the work site for servicing, the operators always dismount for a brief rest period. Over the years there have been many fatalities and serious injuries as the result of operators returning to their equipment and then starting and taking off before the service crew had completed its work.

Listed below are some of the devices used by contractors to prevent such accidents:

A heavy canvas cover, with "DO NOT OPERATE" painted on one side, was designed to slip over the steering wheels of rubber-tired equipment. For track-laying equipment, such as dozers, a wooden sign with the same wording is placed on the operator's seat. The steering wheel covers and signs are put in place by the foreman in charge of servicing and are removed by him when all servicing is completed.

In one contractor's maintenance shop, the foreman suspended a "DO NOT OPERATE" sign from an overhead roof truss, which could be raised and lowered with a sash cord. When a hauling unit was brought into the shop for servicing or repair, the sign was lowered into position directly in front of the operator. When all work was completed, the sign was raised.

On one large dirt job the contractor established a semi-permanent field service area. All equipment was brought to this area for servicing. The foreman in charge mounted a panel of lights in full view of operators. There was a light on this panel for each member of the service crew. When he started to service a piece of equipment, each crew member turned on his light. When he completed his assigned duties, he turned his light off. The operators were instructed never to move the equipment as long as there was a light burning on the panel.

Regardless of the method used to eliminate this hazard, it should provide positive assurance that all persons are in the clear before equipment is moved.

Reliance should never be placed on the safety consciousness of persons exposed to hazards, where it is feasible to provide protection against human error.

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HAZARDS FROM INDUCED VOLTAGE BUILDUP DURING TRANSMISSION LINE CONSTRUCTION

---Howard S. Latham,
Chief Safety Engineer
Bureau of Reclamation

During transmission line construction, particularly during stringing operations, workmen may be subject to dangerous shock voltages from several sources. Accidental energization (from a connecting energized power supply, crossing an energizing circuit, or from lightning) is universally recognized as a hazard, and ordinarily adequate precautionary measures are taken.

Not generally recognized though, is the possibility of dangerous voltage buildup due to electromagnetic coupling from mutual inductance between two adjacent circuits--one isolated and the other energized. The latter hazard is encountered in the construction of both double circuit and parallel high voltage transmission lines. Safety grounding normally employed in transmission line work is usually not adequate to eliminate the hazard of induced voltages in double circuit- and parallel circuit-stringing situations.

Tests on a typical 230-kv double circuit steel tower line indicate that, due to electromagnetic coupling, induced voltages approximating only 1/4 volt per thousand feet for each 100 amperes of load current will be developed in the isolated conductors under normal load and operating conditions. Similar induced voltage buildups occur in paralleling isolated conductors strung on separate but adjacent towers, but to a lesser degree due to increased spacing between the lines. While the induced voltage buildup is comparatively small under normal operating conditions, however it can be lethal during switching and ground fault conditions occurring on the energized paralleling line. For example, on a typical 230-kv steel tower line paralleling a similar energized system at 130-foot horizontal spacing, there can be induced voltage buildup of over five thousand volts per mile during fault conditions. The voltage buildup in double-circuit lines will be correspondingly greater and the situation is even more hazardous due to the reduced distance between the energized and the isolated circuit. Induced voltage buildups, if not adequately provided for, are hazardous to workers on the structures as well as at ground level. Such buildups are known to have caused serious injury and death to workers contacting the isolated line.

To remove the hazard, prevent induced voltage buildup of over 100 volts in the isolated line. Assume the most adverse conditions, such as a major ground fault on the energized circuit.

Grounding each end of the section of the isolated conductors being strung is not enough. Further, using rubber gloves or similar protective equipment is not considered either practical or reliable for extensive construction operations. Fortunately, the hazard from induced voltage during construction of double circuit or paralleling high voltage lines can be safely controlled. Prior to construction, an electrical engineer should determine the possibility and extent of induced voltage buildup from electromagnetic coupling. He should consider the most adverse conditions, such as a major ground fault on the paralleling energized circuit. Should this study show there may be a buildup in excess of 100 volts, adequate safety precautions should be taken. Consider the following recommended safety measures:

1. Provide reliable and qualified work supervisors who will comply with the grounding and safety provisions.
2. Install a moving-type ground or an acceptable alternate grounding device at both the reel setup and the pulling setup (to positively and constantly ground each pulling cable, conductor, and overhead ground wire during stringing operations). Ground the pulling and reeling equipment to clamp-type fixed grounds.
3. Provide for installation of adequate grounds located on each side and within 20 feet of the point where conductor and overhead ground wire splices are being made. The two ends also should be effectively bonded.
4. At predetermined intervals (based upon the calculated induced voltage buildup), ground each isolated conductor to the tower with a hot-stick clamp-type ground. These protective grounds should be left in place until construction is completed and removed with a hot stick as the last phase of cleanup.
5. During stringing operations, ground each pulling cable, conductor, and overhead ground wire at each structure between the reel and pulling setup. This grounding can be carried out in several ways, depending on the type of construction and the stringing equipment used. Where unlined vertical stringing blocks are used, the block can be grounded with a No. 4 AWG copper equivalent or larger ground lead attached to the steel tower with hot-stick-type ground clamps.

When neoprene-lined stringing blocks are used, get adequate grounding by the use of moving-type grounding devices or by the use of stringing blocks lined with conductive neoprene. Where the latter is used, it is recommended that the lining be certified

as "conductive" by the manufacturer. Conductive neoprene-lined stringing blocks are available from several manufacturers of line hardware. Both the moving grounding device and the conductive stringing blocks should be grounded to the steel tower with No. 4 AWG copper equivalent or larger ground leads attached to the tower with hot-stick-type ground clamps.

6. Clipping crews and all others working on the isolated conductors or overhead ground wires should be protected by individual grounds installed at every work location.

The protective measures discussed here pertain principally to steel tower transmission line construction. Similar hazards, however exist in the construction of paralleling wood-pole lines, and adequate precautions should be taken to safely cope with the electromagnetically-induced voltage.

* * * * *

HOW TO HELP IN CASE OF A HEART ATTACK

Call the doctor at once.

Help the patient take the position that is most comfortable for him. (This will probably be halfway between lying and sitting. He usually cannot breathe comfortably if he lies flat.)

Do not attempt to carry or lift the patient without the doctor's supervision.

Loosen tight clothing such as belts and collars.

See that the patient does not become chilled, but do not induce sweating with too many blankets.

Do not give the patient anything to drink without the doctor's advice.

---American Heart Association
44 E. 23rd St., New York City

* * * * *

BRIGHT FUTURE FOR SAFETY PROS

The expanding horizon for safety men was a leading theme at the annual Eastern Regional Safety Convention. Sponsored by the Greater New York Safety Council, the conference is the largest of the spring safety meetings.

Harry Philo, controversial trial lawyer, urged those attending the meeting's American Society of Safety Engineers luncheon to become better safety professionals and held out the prospect of future corporate rewards for their efforts.

"If I were 20 years old today," he said, "and I had a desire to become vice-president of a major corporation, I would become a safety engineer." Most major corporations today have vice-presidents in charge of marketing, purchasing, sales, engineering, and recently lawyers have made it," he said. "The next group to make it will be the safety engineers," he predicted. "If I were the board chairman of an American corporation today, the first thing I would do is get someone of vice-presidential status in charge of safety. The corporations that don't do this are going to have an unfavorable profit and loss picture." Philo cited the influence of workmen's compensation on furthering worker safety and said that court decisions on product liability would have the same effect on product safety.

Philo, a frequent speaker at safety meetings, sees the industrial safety director as the logical person to move into the growing area of product safety and stated that only those corporations that gave high priority to both industrial and product safety could hope to weather the product liability storm ahead.

Philo called upon safety engineers to be prepared to move into positions of higher responsibility that will open up. Safety today is a sophisticated field, he said, and the engineer who learns about "safety" in an engineering school doesn't really know a thing about safety. Engineering training is part of the training of the safety sophisticate; but it is only part of it, and the big corporations are finding this out, he said. "Those corporations that have no competent person in the field of safety are going to be very much in the market for a safety professional in the near future or they are going out of business."

---From National Safety News
June 1967

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

2nd QUARTER, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH JUNE 30, 1967

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
DENVER OFFICE		9,512					
REGION 1							
Baker Project	93	61,695			14	32.4	227
Chief Joseph Dam	6	31,920	1		15	11.3	470
Columbia Basin Project	206	166,718	4		58	24.0	348
Coulee Dam Third Powerplant	6	216					
Hungry Horse Project	6	673					
Mann Creek Project	12	35,245					
Minidoka Project		1,339					
Spokane Valley Project		3,089					
Yakima Project		3,782					
Totals & Averages	329	304,677	7		87	23.0	286
REGION 2							
Tracy Field Division	2	3,902					
Suburn-Polson South Unit CVP Office	18	432					
Presno CVP Construction Office	72	51,504					
Presno Field Division	3	3,637					
Klamath Project Office		1,164					
Lahontan Basin Projects Office	90	18,127					
Red Bluff CVP Construction Office	145	111,494					
San Luis Unit CVP Construction Office	869	920,823	10		289	10.9	314
Transmission Lines Office, Reno		226					
Willows CVP Construction Office	156	77,171	1		4	13.0	52
Totals & Averages	1,355	1,188,570	11		293	9.3	247
REGION 3							
Cibola Field Division		19,998					
Mead Construction Office	56	29,363					
Needles Field Division	11	3,378					
Parker-Davis Project Office	312	335,335	6		265	17.9	790
Palo Verde Field Division	45	23,752					
Totals & Averages	424	411,876	6		265	14.6	643
REGION 4							
Central Utah Project	91	41,359					
CRSP Power Operations Office	119	34,152					
Curecanti Unit	649	490,760	4		165	8.2	336
Durango		1,468					
Grand Junction	10	22,550					
Lyman Project	42	11,677					
Seedskadee Project	12	24,928					
Weber Basin	9	6,321					
Totals & Averages	932	613,215	4		165	6.3	261
REGION 5							
Arbuckle Project	7	8,517					
Austin Development Office	4	936					
Canadian River Project	141	83,464	3		62	35.9	743
Navajo Project	207	216,950	13		1,197	59.9	5,517
Pecos River Water Salvage Office	14	7,141					
San Juan-Chama Project	457	477,073	5		580	10.5	1,216
Totals & Averages	830	794,081	21		1,839	26.4	2,316
REGION 6							
Fort Peck Project	9	2,462					
Missouri-Cake Projects	31	1,152					
Missouri-Souris Projects	8	2,119					
Riverton Project		88					
Upper Missouri Projects	141	65,917					
Yellowtail Project	18	20,808					
Totals & Averages	207	94,546					
REGION 7							
Fryingpan-Arkansas Project	902	674,150	19		252	28.1	374
Kansas River Projects	428	428,575	6	1	6,106	14.0	14,247
Mohrara-Lower Platte Dev. Office	10	10,447					
North Platte River Projects	56	35,798					
South Platte River Projects		160					
Totals & Averages	1,396	1,149,130	25	1	6,358	21.8	5,533
CONSOLIDATED TOTALS	5,473	4,585,607	74	1	9,007	16.1	1,964
TOTALS LAST YEAR (1966)	5,168	14,476,443	194	13	98,137	13.4	6,779

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

2nd QUARTER, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH JUNE 30, 1967

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Washington Office	363	354,176					
Denver Office	1,467	1,451,936					
Alaska District	42	43,532	1		10	23.0	230
REGION 1							
Boise Regional Office	184	166,950					
Baker Project	37	32,131					
Central Snake Project	38	37,190					
Chief Joseph Dam	32	35,603					
Columbia Basin Project	945	915,666	4		52	4.4	57
Grand Coulee Dam Third Powerplant	76	59,039	2		125	33.9	3,134
Green Springs Powerplant	2	1,911					
Hungry Horse Project	54	53,006					
Lower Columbia Development Office	44	43,479					
Mann Creek Project	14	17,038					
Minidoka Project	68	69,849					
Snake River Development Office	57	52,523					
Spokane Valley Project	23	24,525					
Upper Columbia Development Office	47	43,124					
Yakima Project	30	27,420	1		56	36.5	2,115
Totals & Averages	1,651	1,579,582	7		295	4.4	187
REGION 2							
Sacramento Regional Office	596	634,279					
Regional Drill Crew	32	31,560					
Auburn-Folsom South Unit CVP Constr. Off.	60	72,380					
Cachuma Operations Field Branch	2	2,048					
Central Coast Dev. Field Branch	5	5,041					
Folsom Field Division	71	69,798					
Fresno CVP Construction Office	112	110,884					
Fresno Field Division	140	142,552					
Klamath Project Office	16	17,057					
Lahontan Basin Projects Office	47	37,444	1		30	26.0	780
Napa Development Field Branch	6	6,144					
Red Bluff CVP Construction Office	63	66,504					
San Luis Unit CVP Construction Office	418	440,544	1		18	2.3	41
Shasta Field Division	133	133,129	1		5	7.5	35
Solano Operations Field Branch	2	2,048					
Tracy Field Division	162	171,432					
Transmission Lines Office, Reno	27	28,891					
Upper North Coast Development Field Br.	4	4,096					
Willows CVP Construction Office	113	112,262					
Totals & Averages	2,639	2,049,097	3		53	1.4	25
REGION 3							
Boulder City Regional Office	179	145,600					
Boulder City Development Office	55	39,424					
Boulder Canyon Project Office	159	141,972	1		45	7.6	317
Dixie Project Office	9	22,970					
Lower Colorado River Control Office	25	23,844					
Cibola Field Division	100	91,270	2		218	21.9	2,349
Laguna Field Division	20	15,545					
Needles Field Division	55	48,123	1		52	26.4	1,061
Palo Verde Field Division	15	17,170	1		44	58.2	2,563
Mead Construction Office	24	18,920					
Parker-Davis Project Office	315	304,303	2		95	6.6	312
Phoenix Development Office	86	82,256					
Southern California Development Office	39	35,792					
Yuma Projects Office	161	151,520					
Totals & Averages	1,241	1,141,709	7		454	6.1	398
REGION 4							
Salt Lake City Regional Office	255	227,418					
Central Utah Project Office	211	175,690					
CRSP Power Operations Office	304	317,304					
Oreocanti Unit	142	145,585					
Durango	35	31,576					
Grand Junction Projects Office	64	74,888					
Logan Development Office	9	10,720					
Lyman Project	35	25,360					
Seedskadee Project	21	24,533					
Upper Green River Development Office	9	8,116					
Weber Basin Project	74	79,512					
Totals & Averages	1,159	1,120,712					
REGION 5							
Amarillo Regional Office	113	118,141					
Albuquerque Development Office	33	35,396					
Arbuckle Project	9	12,915					
Austin Development Office	50	50,376					
Canadian River Project	68	73,927					
Lower Rio Grande Project	2	2,032					
Middle Rio Grande Project	202	219,943					
Navajo Indian Irrigation Project	92	92,175					
Oklahoma City Development Office	21	18,878					
Pecos River Water Salvage Office	6	2,584					
Rio Grande Project	226	223,181	2		52	6.6	233
San Juan-Chama Project	21	21,103					
Totals & Averages	903	933,251	2		52	2.1	56
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

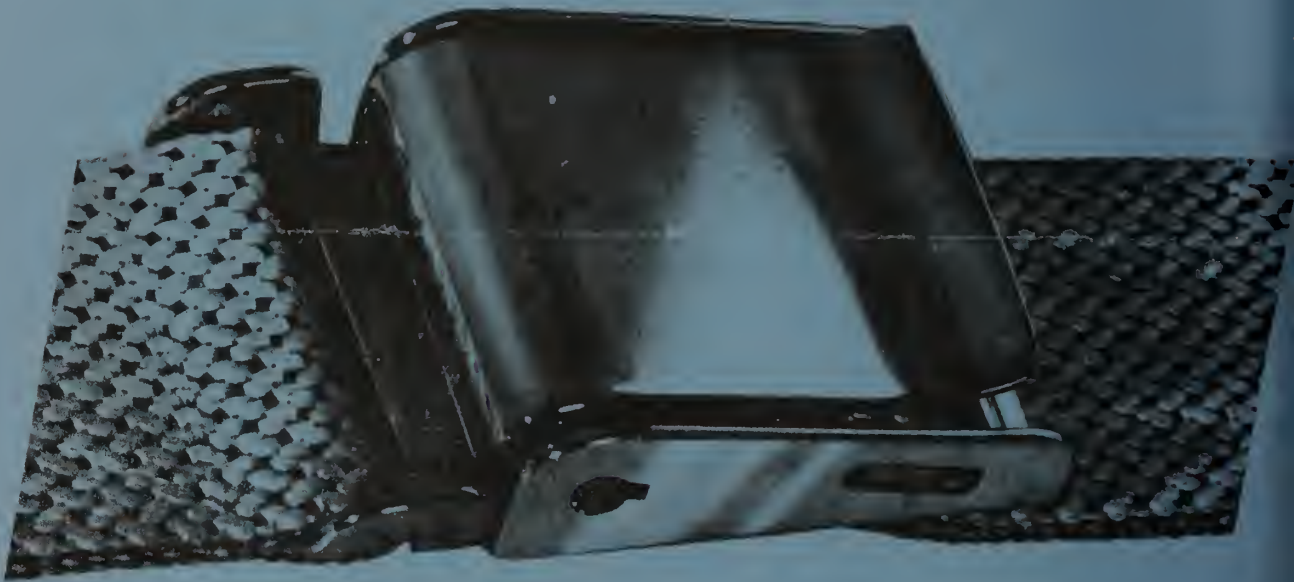
GOVERNMENT FORCES

2nd QUARTER, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH JUNE 30, 1967

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	172	161,280					
Geology and Drill Crews	19	15,667					
Canyon Ferry Project	21	16,694					
Fort Peck Project	37	35,267					
Missouri-Ozark Projects	197	181,440					
Missouri-Souris Projects	162	140,176	1		6	7.1	43
Power Systems Operations Office	44	46,400					
Riverton Project	5	4,961					
Upper Missouri Projects	116	108,529	1		4	9.2	37
Yellowtail Project	72	81,132					
Totals & Averages	845	791,546	2		10	2.5	13
REGION 7							
Denver Regional Office	220	226,016					
Dryden-Arkansas Project	253	262,744	2		41	7.6	156
Kansas River Projects	195	219,104					
Nebraska-Lower Platte Dev. Office	39	46,148					
North Platte River Projects	249	250,991					
South Platte River Projects	167	163,464					
Totals & Averages	1,153	1,168,467	2		41	1.7	35

FACTS



1. Two-thirds of the drivers involved in fatal accidents live within 25 miles of the crash. Even a short trip to the grocery store can be dangerous. Wear seat belts whenever and wherever you go.
2. Actual crash condition tests prove your chances of being killed are five times greater if you are thrown out of your car.
3. "The seat belt, properly used, pulls down and back across the pelvis and hips, not across the abdomen. Even a woman in the last months of pregnancy may safely wear them." American Medical Assoc. Journal.
4. A seat belt meeting acceptable standards can be purchased for as little as \$4.95....about the cost of a steak dinner. What is your life worth?
5. If your car catches fire or goes under water in an accident, a seat belt will hold you in place and lessen your chances of being knocked unconscious. The seat belt can be released in a second with the flip of a finger.
6. Seat belts should be worn for comfort as well as for safety. They help you maintain good posture and reduce fatigue. They keep you behind the wheel when emergencies occur and help to prevent accidents.
7. A seat belt restrains you. It lessens the impact of the blow. BUT, it is never a substitute for careful driving.
8. Smart drivers do everything they can to keep themselves and their passengers alive and comfortable. How's your seat belt I. Q. ?

MISSION
SAFETY

70

RECLAMATION SAFETY NEWS

WINTER DRIVING HAZARDS



Third Quarter 1967

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OFFICE OF CHIEF ENGINEER

UNIVERSITY OF ILLINOIS

BERNARD



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SAFETY NEWS is published quarterly by the Office of
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Denver, Colorado, in the interest of
accident prevention.

BUREAU SAFETY PERFORMANCE

1967 CUMULATIVE SAFETY RECORD

January 1 - September 30, 1967

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 2	0.2	1.0	17	1.7
Region 6	0.2	1.7	9	3.0
Region 7	0.3	1.1	23	2.4
Region 5	1.9	3.6	52	4.6
Region 4	3.8	1.8	211	1.3
Region 1	8.2	5.4	152	4.5
Region 3	16.2	5.1	318	2.4
Alaska	<u>23.1</u>	<u>15.2</u>	<u>152</u>	<u>0.0</u>
Totals to Date	2.3	2.4	97	2.9

Totals 1966	19.9	2.3	864	3.1
-------------	------	-----	-----	-----

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	2.3	5.8	40	0
Region 4	17.3	6.4	270	0
Region 2	21.7	8.7	249	0
Region 1	29.0	16.3	178	0
Region 3	153.2	16.4	934	0
Region 5	357.9	20.5	1,746	0
Region 7	<u>1,336.0</u>	<u>22.2</u>	<u>6,018</u>	<u>2</u>
Totals to Date	319.2	15.0	2,128	2

Totals 1966	908.4	13.4	6,779	13
-------------	-------	------	-------	----

C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate	2.2
Severity rate	1,633
Vehicle accident rate	26.8

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1967
Third Quarter

Cumulative to Date:
September 30, 1967

A. ACCIDENT CLASSIFICATION

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Water craft	3	319
Vehicles	8	238
Electricity	1	7
Handling materials and equipment	12	373
Falling objects (rock)	1	30
Striking against material	1	4
Flying particles	1	4
Handtools	1	13
Falls of persons	8	145
Machinery	2	375
Rattlesnake bite	1	52
Totals	39	1,560

B. OPERATIONAL SUMMARY

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	6,711,187	2	108	0.3	16
Construction	3,090,532	14	892	4.5	289
Investigation	1,591,843	2	28	1.3	18
Power O&M	2,671,885	10	342	3.7	128
Irrigation O&M	2,033,633	11	190	5.4	93
Totals	16,099,080	39	1,560	2.4	97

C. SERIOUS ACCIDENTS

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
1-26-67	Drill Operator	Operating machinery	135*
3-30-67	Drill Operator	Handling equipment	50*
8- 7-67	Foreman Lineman	Handling equipment	100*
9-22-67	Maintenanceman	Operating machinery	240*

*Permanent partial disabilities (fixed time and charge).

BUREAU SAFETY PERFORMANCE

1967 CUMULATIVE SAFETY RECORD

January 1 - September 30, 1967

A. GOVERNMENT FORCES

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<hr/>				
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Region 3	153.2	16.4	934	0
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Handtools	1	13
Falls of persons	8	145
Machinery	2	375
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9-22-67	Maintenanceman	Operating machinery	240*

*Permanent partial disabilities (fixed time and charge).

Government Forces
January 1 - September 30, 1967

DISABLING WORK INJURIES

By Regions and By Part of Body Injured

Part injured	*Days lost	Total disabling injuries	Alaska	Denver Office	Regions						
					1	2	3	4	5	6	7
Neck	94	2		1	1						
Wrist	45	1					1				
Hand	13	1			1						
Fingers	582	6			3		1	2			
Abdomen	167	4			1		2		1		
Back	82	5	1		3						1
Ribs, chest	29	3			1	1			1		
Thigh	5	1					1				
Leg	146	6					2	1	2	1	
Knee	242	5			2		1		1		1
Foot	49	2					1			1	
Internal and multiple	106	3			1	2					
Totals	1,560	39	1	1	13	3	9	3	5	2	2

*Includes scheduled charges for permanent-partial disabling injuries.

PERCENTAGE OF BUREAU EMPLOYEES
SUFFERING DISABLING AND NONDISABLING INJURIES

Region	Total no. of employees	No. of disabling injuries	Percentage suffering disabling injuries	Non- disabling injuries	Percentage suffering nondisabling injuries
Region 1	1,654	13	0.79	74	4.5
Region 2	2,007	3	0.15	97	4.8
Region 3	1,195	9	0.75	71	5.9
Region 4	1,151	3	0.26	36	3.1
Region 5	887	5	0.56	37	4.2
Region 6	812	2	0.25	23	2.8
Region 7	1,123	2	0.18	36	3.2
Alaska	41	1	2.4	1	2.4
Denver Office	1,400	1	0.07	11	0.8
Washington Office	364	0	0.00	0	0.0
Totals	10,634	39	0.37	386	3.6

Government Forces
January 1 - September 30, 1967

NONDISABLING WORK INJURIES

By Regions and By Part of Body Injured

Part injured	Total	Alaska	Denver Office	Regions						
				1	2	3	4	5	6	7
Total*	386	1	11	74	97	71	36	37	23	36
Ear	5			1		2	2			
Eye	51			14	11	10	4	4	4	4
Head	18		1	3	2	5	3	1		3
Neck	9			2	1	2	1		1	2
Upper arm	2	1			1					
Lower arm	10			1	3	2	1		1	2
Elbow	7		1	3	1		1	1		
Wrist	5		1	1	1	2				
Hand	23		1	1	8	5	2	4		2
Fingers	66		3	11	17	7	8	4	6	10
Abdomen	9			2	1	1	2	2		1
Back	46			12	7	11	5	5	4	2
Hips	6			2	2	2				
Shoulders	7	1		1	2	1		1		1
Ribs, chest	16		1	3	3	5	2	2		
Thigh	11			1	2	3		2		3
Leg	25			8	3	3	2	4	1	4
Knee	16			4	1	5	2	1	1	2
Foot	19		2	3	6	3	1	4		
Toes	12		1	3		2		3	1	2
Respiratory system	7			3		1	1	1		1
Poison oak or ivy**	31				27				4	

*Columns will not equal totals where an accident involved an injury to more than one body part.

**Not shown by body part.

Nondisabling work injuries listed above involved medical expense but no chargeable lost time.

* * * * *

SAFETY AWARDS

DEPARTMENT OF THE INTERIOR CERTIFICATE OF SAFETY ACHIEVEMENT



Mr. Herb Thomson (right), Chief, Tracy Field Division, Tracy, California, receives the Department's Certificate of Safety Achievement from Mr. R. G. Howard, Regional Supervisor of Irrigation and Chairman of the Regional Safety Committee. The award recognizes more than 500,000 miles of accident-free driving by employees of the Tracy Field Division. This Division has now accumulated an additional 700,000 accident-free miles for a total of 1,201,978 during the period August 5, 1966 to July 27, 1967.

CONSTRUCTION SAFETY AWARD

The Bureau of Reclamation Construction Safety Award was presented to Granite Construction Company of Watsonville, California, during a brief ceremony before employees of the Fresno CVP Construction Office on August 17, 1967. The award was in recognition of the outstanding safety record achieved during construction of Laterals 1, 2, and 3 of the distribution system for Westlands Water District. The Granite Construction Company completed work under contract Specifications No. DC-6369 more than 6 months ahead of schedule without experiencing a single disabling injury. Shown below: Reclamation's Project Construction Engineer R. C. Lovelace congratulates R. A. Lindsay, center, Manager of the Underground Department for the contractor; Office Engineer G. G. Drake is shown at the right.



Construction Safety Awards have been earned by the following contractors for the exemplary safety records achieved while completing their contracts with the Bureau of Reclamation:

Guy F. Atkinson Company--Specifications No. DC-6033--Forebay Pumping Plant and Appurtenant Works and Forebay Dam Spillway--San Luis Unit--Central Valley Project, California

Myers Construction Company--Specifications No. DC-6387--Corning Canal modification and controls--Sacramento Canals Unit--Central Valley Project, California

Purtzer & Dutton--Specifications No. DC-6365--Tehama-Colusa Canal, Station 0+65 to Station 29+64--Central Valley Project, California

Henry S. Rau Company, Inc.--Specifications No. DC-6398--Cleaning and filling contraction grooves in concrete canal lining, concrete canal lining crack repairs and related work for San Luis Canal--Central Valley Project, California

Brasel & Sims Construction Company--Specifications No. DC-6374--Means Canal, West Side Lateral--Eden Project, Wyoming

E. Arthur Higgins Construction Company--Specifications No. DC-6425--Enlargement of Woods Cross Equalizing Reservoir--Weber Basin Project, Utah

Varulco--Specifications No. DC-6314--Silt Pumping Plant and Appurtenant Works--Silt Project, Colorado

Paul E. Hughes Construction Company--Specifications No. DC-6438, Schedule No. 1--Modifications to River Pumping Plant--Chief Joseph Dam Project, Washington

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ACCIDENT REVIEW

FLYING PARTICLES

Activity: Government mechanic and helper repairing track on crawler-type tractor.

Accident situation and occurrence: Two employees were replacing a track on a crawler-type tractor. In the process of replacing the master track pin, a piece of flying steel became lodged in the mechanic's left leg below the knee. The injury resulted in 4 days' lost time.

Cause determination and prevention: The mechanic was driving the pin in place with a 12-pound hard steel hammer. This accident possibly could have been avoided by proper planning that included (1) Cleaning the pin and track links with emory cloth, (2) providing means by which the links could be expanded by heat, and (3) using a softer hammer to drift the pin. In addition to heating the links with a torch, most mechanics cool the pin with dry ice, or other means, allowing it to shrink and move freely through the enlarged links.

HANDLING MATERIALS AND EQUIPMENT

Activity: Well-drilling operations.

Accident situation and occurrence: A driller was assisting in the installation of the tremie pipe prior to gravel packing when the pipe slipped, catching the fingers of his left hand between the chain tongs held in his left hand and the wooden working platform adjacent to the casing. Parts of two fingers were lost, resulting in a scheduled time charge of 250 days.

Cause determination and prevention: The accident was caused by the method used to secure the tremie pipe during breaking operations. A positive method to secure the pipe to prevent it from slipping is now accomplished by the use of a "spider" with four set screws. Although the method used at the time of the accident is reportedly an accepted method, a slight counterclockwise movement of the pipe caused the chain to loosen, thus allowing the pipe to drop. Careful examination and analysis of drilling operations is constantly necessary.

HEAVY EQUIPMENT OPERATION

Activity: Canal excavation.

Accident situation and occurrence: The steering control on a prime mover and scraper failed, causing it to overturn in an irrigation ditch. While there was damage to the equipment, the operator was unhurt. The operator was protected by antirollover bars and a heavy duty seat belt as prescribed by the State Industrial Commission of the State of California.

Cause determination and prevention: Preliminary investigation of the accident indicates that steering control was lost as a result of an electrical failure in the steering system. Similar malfunctions or loss of control have been experienced in the operation of equipment with electric-driven steering systems. Accidents of this type can be prevented through scheduled preventive maintenance. Inspection of the electric contacts should be scheduled daily when such equipment is operating over rough and rugged terrain. Later models of this type of equipment have been modified to reduce possibility of steering loss.

Note: A significant factor in this accident is the fact that the antiroll bar and seat belt protected the operator from serious or possible fatal injury.

HEAVY EQUIPMENT OPERATION

Activity: A maintenanceman was grading a road with an Allis-Chalmers tractor loader, with a boy riding on the drawbar.

Accident situation and occurrence: In an attempt to avoid hitting a large rock, the tractor operator stepped on the left rear brake only instead of both brakes. This caused the tractor to swerve left and overturn, pinning the boy beneath it. Fortunately, the boy was not seriously injured.

Cause determination and prevention: It is against Bureau regulations to allow an unauthorized person to ride equipment, such regulations are listed below. Violation of these safety regulations subjects the individual to possible injury and subjects the Government to possible tort claims action.

Paragraph 9-5 of Safety Requirements for Construction by Contract states that "Riding on equipment by unauthorized personnel is prohibited."

Reclamation Instructions, Series 590 Safety Techniques and Standards, Part 593 Tools and Equipment, Paragraph 593.4.8 states:

"Tractors and Bulldozers. Only one person, the operator, should ride on a tractor, the only exception being when the operator is teaching a student to drive. Tractors should never be left unattended with the engine running and brakes not set. When it is necessary to park tractors on sloping ground, they shall be securely blocked and the brake set. Operators of bulldozers should not drive with the blade raised so high that vision ahead is obscured and when the operator leaves the machine the bulldozer should be lowered to the ground. Workmen must not be permitted to work in areas where bulldozers are operating above them on excavated slopes or on top of banks where there is danger of the heavy equipment or material falling on them."

WORK INJURY RATES IN THE HEAVY CONSTRUCTION INDUSTRY*

<u>Kind of construction</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Tunnels	56.8	15,326
Pipelines, gaslines, gas mains	41.2	3,548
Pile driving	39.4	2,193
Railroads	36.1	1,597
Sewers and water mains	31.4	4,700
Docks and piers	30.3	8,684
Dredging	30.0	4,433
Powerlines	28.8	9,845
Bridges	28.3	4,687
Heavy foundations	25.4	2,607
Land clearing	22.6	1,995
Dams	20.7	7,041
Industrial plants and equipment	14.6	2,472
Other	11.8	2,427

*From Bureau of Labor Statistics Report No. 318, June 1967, covering rates for 1961.

* * * * *

The best safety device known to man is the one you carry on your shoulders.

Sign on the rear of a truck: "Many a man has carved his tombstone by chiseling in traffic."

* * * * *

FROM THE FIELD

Region 2 Regional Office, Sacramento, California--Regional Safety Committee: The Committee meets at least once a month to review and evaluate the safety program and determine what action is required to improve the accident record. The members of the Committee are responsible for reviewing accident reports, recommending corrective measures, reviewing the accident experience, and assisting in initiating and carrying out employees' safety training and education.



Committee members and guests present at the September 19, 1967 Regional Safety Committee meeting are shown above, left to right: Messrs. J. R. Hammond, Assistant Chief of Operations; E. R. Klinke (alternate for J. E. Stokes, Regional Supervisor of Power); T. G. Skordas, Safety Officer; V. J. Hansen, Regional Project Development Engineer; A. R. Kaznowski, IBEW Representative; R. G. Howard, Regional Supervisor of Irrigation and Committee Chairman; R. W. Cary, Regional Safety Officer; C. D. Simpson, Administrative Officer, Tracy Field Division (guest); H. W. Thomson, Chief, Tracy Field Division (guest); T. K. Vasey, Assistant to the Regional Director - Administrative Management, and W. J. McCrystle, Regional Engineer.

A Permanent Instructor's Certificate for U.S. Bureau of Mines Training in First Aid Methods was presented to Safety Officer T. G. Skordas (below, right) by Regional Safety Officer R. W. Cary (left) in the Regional Office, Sacramento, California, on September 19, 1967. Mr. Skordas has since transferred to the Third Powerplant Construction Office, Coulee Dam, Washington.



Lahontan Basin Project Office, Carson City, Nevada: Mr. W. J. Wick, Chief, Office Services Division, Lahontan Basin Projects Office, received a certificate from the Northern Nevada Federal Safety Council in recognition of his service as Chairman of the Council during 1966. Congratulations were offered to Mr. Wick for his outstanding performance and efforts in increasing safety efforts among Government agencies in the area through quality safety programing.

Parker-Davis Project, Phoenix, Arizona--Safety Training: Project Safety Officer Hubert S. Jerrell conducted a training session at the Coolidge Substation to increase the employees' proficiency in the use of a self-generating-type oxygen breathing apparatus. The 3-hour session consisted of a discussion pertaining to the operating principles of the apparatus, method of putting on and adjusting the apparatus, then exposing all available employees to a smoke-filled environment while wearing the unit.

Region 4 Regional Office, Salt Lake City, Utah: Regional Safety Officer R. J. Searle recently spoke at the Utah Safety Conference discussing the Bureau's Driver Improvement Program. He also spent 3 days assisting the Utah Safety Council in conducting the Driver Improvement Course for highway patrolmen, deputy sheriffs, and city and county police officers.

Fryingpan-Arkansas Project, Construction Field Division, Salida, Colorado: Mr. William O. Bennett, Bureau of Reclamation Construction Inspector in the Divide Tunnel, was selected by the Colorado Highway Patrol for his outstanding motor vehicle operation. A \$50 Savings Bond was his personal award.

Glen Elder Unit--Missouri River Basin Project, Kansas: Shown below is a view of ladders and scaffolds attached to the center pier of the relocated County Highway No. C-705 bridge across the Solomon River south of Cawker City, Kansas. Near the top of the pier the cables and supports for the safety nets may also be noted.



P 495-701-5510A

Below is another view of the safety netting and method of supporting it on the relocated County Highway No. C-705 bridge. Visible between the steel girders is the cross-bracing used between the girders. These safety features were constructed by the Bushman Construction Company under Specifications No. DC-6419 on the Glen Elder Unit, Missouri River Basin Project in Kansas.



* * * * *

WATER SAFETY

San Luis Unit, Los Banos, California: Safety Officer Larry Thomas gave water safety lectures to the Lemoore Rotary Club, Lemoore, California, and to personnel of the Bell Telephone Company, Sacramento, California, on August 29 and 30. Approximately 150 persons attended the two lectures.

South Platte River Projects, Loveland, Colorado: The Northern Colorado Water Safety Council, at its regular monthly meeting in September, held a dinner honoring two recipients of lifesaving awards and two members of the Council, Mrs. Schwab and Mrs. Sykes, for their work in the Council. The honored guests at the annual recognition dinner are shown in the photograph below. Standing, left to right, are: Miss Suzanne Harrison, Mr. A. B. Stevens, Mrs. Leona Schwab, and Miss Grace Clinger. Seated are Mrs. John W. Harrison, Mr. Kenneth Whitmore, Mrs. Harriet Sykes, and Mr. D. A. Sykes.



PX-D-59549

RECORD OF PUBLIC DROWNINGS

January 1, 1967 through September 30, 1967

Bureau-operated Facilities:

Canals	14
Reservoirs	3
Total	<u>17</u>

Facilities Operated by Others:

Irrigation and Water Districts	12
State or County (Recreational)	36
Total	<u>48</u>

Summary of Total Drownings During Period:

By Operating Agency:	
Bureau of Reclamation	17
Irrigation and Water Districts	12
State or County (Recreational)	36
Total	<u>65</u>

By Type of Facility:	
Canals	23
Dams (pond below dam)	2
Reservoirs	40
Total	<u>65</u>

By Activity:	
Swimming	21
*Boating	12
*Fishing	--
Fell into water	18
Other	14
Total	<u>65</u>

By Age:	
Under 12 years of age	13
From 12 to 25	23
From 25 to 50	20
Over 50 years of age	9
Total	<u>65</u>

*Five were fishing from boats.

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VEHICLE SAFETY

1967 NATIONAL DRIVERS TEST -- YOUR SECOND CHANCE!

On December 5, just 20 days before Christmas, the driving public will have an opportunity to re-view the 1967 National Drivers Test.

The test will be televised in color over the CBS network, Tuesday evening, December 5. Watch your local newspaper for the exact time in your area.

The National Safety Council has announced that the three main objectives of the National Drivers Test are:

1. To persuade people to drive defensively.
2. To enroll people in defensive driving courses.
3. To provide important data for future research projects.

The program, televised just 20 days before Christmas, is timely and should stimulate safe defensive driving techniques over the long holiday period. A large segment of the test is devoted to the special problems of winter driving. It also includes dramatic new sequences on mountain driving, school buses, motorcycles, and driving distractions.

Travelers Insurance, sponsors of the December showing of the 1967 National Drivers Test, will print millions of the test forms and make bulk quantities available, on request, to organizations. For large quantities, write:

1967 National Drivers Test
Travelers Insurance Companies
One Tower Square
Hartford, Connecticut 06115

The National Drivers Test involves the viewer in the most important mass driver education effort to date. Take advantage of it!

LEARN THE LESSONS OF WINTER-WISE DRIVING

1. Have your car ready for winter.
2. Keep windshield, windows, and lights clean.
3. Start with a gentle touch; don't spin wheels.
4. Steer steady, increase following distance, watch for temperature traps.
5. Stop by pumping the brakes, use winter tires and chains.

SMART DRIVERS USE SEAT BELTS . . .

Because They Reduce Injuries By More Than Half . . .

Because They Save Lives.

By The National Safety Council

The Quick and the Dead

There is an important difference between the two, and very often what makes the difference is a seat belt. The findings of Cornell University's Automotive Crash Injury Research confirm this. Two groups of accidents were compared. The accidents were selected to make them as identical as possible in all respects, except that the passengers in one group wore safety belts. In the group without belts, the frequency of serious injury was high. The frequency of serious injury among those with seat belts was low. The study shows that people with seat belts are 35 to 60 per cent safer than are people without seat belts.

What does this mean in terms of human life? Cornell University scientists estimate that seat belts, if widely used by the motoring public, could save 5,000 lives each year merely by holding people inside the car in case of an accident.

How Do They Work?

In many ways the human body is remarkably durable. It can survive far greater jolts than are experienced in most auto crashes, provided it does not strike, or is not struck by, some hard or sharp object. Col. John P. Stapp, director of the Air Force Aero Medical Field Laboratory, has subjected himself to crash stops from 632 m. p. h. to 0 in 1.4 seconds.

Such crash stops involve deceleration forces much higher than those experienced in most auto collisions.

Col. Stapp suffered no disabilities because he was held in his seat by safety belts. He survived, as many car drivers with seat belts do, by coming to a comparatively gradual stop.

When a car crashes, the motorist without a seat belt to stop him flies forward at unreduced speed--for a split second still uninjured--until he hits something solid. This is the impact that kills and maims. It is the violence of the reduction in speed, not the speed itself, which kills. Thus, even low speed collisions can produce high deceleration rates. Seat belts help prevent injury by letting you slow down and live.

Who Says?

The American Medical Association, the Public Health Service and the National Safety Council, among others. Existing safety programs must continue to be strengthened because the best insurance is not to have an accident in the first place. But the seat belt is the best self-help now available to cut the toll of dead and injured--if an accident does happen.

Why?

Careful analysis of auto accidents by crash injury research experts shows that in a traffic accident:

A belt helps prevent being thrown forward--toward the dashboard, for example. Even if your head does hit the dash, with a seat belt the blow is not nearly so hard. That can mean a minor injury instead of a major injury, living instead of dying.

You are much safer inside the car. A seat belt will help keep you there. In the Cornell study, 12.8 per cent of car occupants ejected through open doors were killed, but only 2.6 per cent of those who remained in the cars were killed. Thus, the risk of death is five times greater for those thrown from the car. Even inside the car, you are safer if you are held in place by a seat belt--as much as 60 per cent safer.

Everyone is safer when the driver is kept behind the wheel. In case of an unexpected crash or sudden swerve, a seat belt keeps the driver from being thrown from behind the wheel. Thus, he stays in control of the car and can prevent an additional crash.

Any Questions?

How about a car on fire or under water? Persons using seat belts are more likely to stay conscious and are therefore more likely to be able to escape. It takes only an instant and only one hand to release the belt buckle.

How many seat belts are needed in a car? A separate seat belt should be provided for each passenger. This includes the driver and all passengers, in the back seat as well as the front. A seat belt is especially important for a youngster, since he can be thrown forward so easily by sudden stops.

Are seat belts necessary for short, local trips? Yes! Seat belts should be fastened any time the car is in motion. Two-thirds of the drivers involved in fatal accidents have their accidents less than 25 miles from home. Many people are hurt at slow speeds. More than half of all injuries occur in urban areas. That short trip to the grocery store can be dangerous, so "fasten your safety belts, please!"

How about long trips? Seat belts should be worn when riding on the open highway. The driver who sees a crash coming will slow down as rapidly as possible to make the crash less severe. Even if a collision is avoided, the fast stop can cause serious injury--unless there are seat belts to hold driver and passengers in place. As a matter of fact, many people say that seat belts reduce fatigue on long trips by reducing the strain of staying in place on normal stops and turns. Belts should be adjusted to a snug fit at all times.

The Right Choice

Choosing a seat belt need not be a problem, if the buyer insists on a belt that measures up to the safety belt standards set by the Society of Automotive Engineers. These S. A. E. standards cover such matters as breaking strength, ease of releasing buckle and resistance to corrosion.

Installing the Belts

See that the belt is fastened to the car structure, according to the manufacturer's instructions that come with the belt.

The most practical style of belt fastens across the lap, with the belt securely anchored just behind the seat. A body rail or cross member provides the most reliable anchorage, because the sheet metal of the floor may be weakened by rust or corrosion. However, the belt ends can be fastened to the car floor with safety if the floor pan is in good condition and the recommendations for installation are followed.

Careful Driving Comes First

Seat belts are important personal protection equipment. Like the hard hats, safety glasses and hard-toe shoes used in industry, seat belts help decrease the severity of accidental injury or prevent injury when accidents occur. But seat belts are no substitute for careful driving.

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STATE REPORTS OF DRINKING AND ACCIDENTS

According to the latest year-long study conducted in California, nearly three out of five of the fatally injured drivers tested, who were responsible for accidents, had been drinking. In one-car accidents, the proportion approached two out of three. Nearly two out of three drivers among 369 tested in Wisconsin, who died in traffic accidents during 1965 and 1966, had been drinking.

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NEW ADDITION TO DENVER FILM LIBRARY

The motion picture, "Automobile TIRE HYDROPLANING What Happens!" has been prepared by the Bureau of Public Roads, Department of Commerce, with the assistance of the National Aeronautics and Space Administration, to point out and alert the public to this dangerous hazard on our highways.

Requests for loan of this 12-minute sound-motion color film for project showing should be addressed to the Chief Engineer's Office, Attention: 841.

What is TIRE HYDROPLANING? When you are driving your car on a wet highway, water may penetrate between the tire and the pavement. This penetration results in the formation of water pressure which raises a portion of the tire off the pavement. This pressure increases with increasing speed of the vehicle, supporting more and more of the tire, until at a critical speed, termed the hydroplaning speed, the tire is supported only by the water, and loses all contact with the pavement.

When does TIRE HYDROPLANING occur? Tire hydroplaning occurs when the speed of the vehicle, tire inflation pressure, water depth on the road, condition of the pavement surface, and the condition of the tire tread are combined in such fashion that the tire loses contact with the pavement.

What are the consequences of TIRE HYDROPLANING? The most serious consequence of tire hydroplaning is the loss of traction which is necessary for safe steering and braking. This may be a partial loss of traction due to partial hydroplaning, or total loss of traction at total hydroplaning speeds.

What can you do about TIRE HYDROPLANING?

1. Slow down when roads are wet. A wet road may be just as slippery as an icy road; all traction is lost at hydroplaning speeds.
2. Be alert for standing water or puddles, especially on curves.
3. Keep good tires on your car, and keep the tires properly inflated.
4. Increase following distances to give yourself more time and distance to stop or control your car.
5. Be alert for side winds which can affect vehicle control.
6. Adjust your speed to road conditions, and remember that hydroplaning can occur well below posted speed limits.

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"HOLD-HARMLESS" CLAUSES DON'T STOP ACCIDENTS

"Hold-harmless" clauses in contracts are a convenient way of passing accident liability from one contractor to another until it reaches the lowliest subcontractor on the job. Such clauses, in themselves, do little to prevent injuries to the workmen. In many cases, the hold-harmless clause protects the unsafe contractor.

Safety engineers must understand that hold-harmless clauses are going to do little to help them accomplish their work. Contractors must recognize their moral responsibility to prevent an accident to anyone, even though they have a hold-harmless clause in their subcontractor's contract.

The efforts of all contractors must be coordinated towards the common goal of preventing accidents.

There really isn't anything that owners, lawyers, management or anyone else can purchase through a "hold-harmless" clause which will stop accidents.

Safety efforts on the job are the only things that can do this.

By Bernie Enfield, Chicago Bridge & Iron Co.
From a National Safety Council
"Construction Safety Release"

PROPOSED LEGISLATION

Senator Gaylord Nelson (Wis.) introduced S. 2148 concerning the safety and health of all workers in the construction and building industry, working on Federal and Federally-financed or assisted construction projects.

The bill would require the U.S. Secretary of Labor to (1) develop safety and health regulations; (2) inspect worksites for unsafe conditions and hazards, and provide consultation services; (3) conduct safety training and education programs for construction workers and supervisors; and (4) work with State and local governments where construction is being done in their jurisdiction.

The Senator said that "the lack of standard safety codes and safety organizations in some local governments in this country is appalling. "

This is a companion bill to HR2567 introduced by Congressman O'Hara of Michigan earlier this year.

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WAYS TO PROTECT YOURSELF FROM BACK INJURIES

If you're a woman, make it a rule never to lift a weight greater than 25 pounds--regardless. If you're a man, limit yourself to lifting half your weight, less if you're overweight.

Remember that your arms and legs are levers but your back is not. So when lifting from the floor, use your limbs as much and your back as little as possible. Always bend your knees to reach the object to be lifted, keeping your spine as straight as possible. Then after grasping the object, continue to keep your back as straight as you can and make your arms and legs do most of the work.

Never stay bent over a low sink, kitchen range or workbench for prolonged periods. Your back muscles can fatigue quickly and when tired they can "let go" suddenly.

Don't overdo. When working at unusual tasks such as seasonal gardening or window washing, rest frequently by either lying down for short periods or by changing the nature of your activity occasionally to use new muscles while resting the tired ones.

Finally, think twice before taking on any heavy or awkward burden involving the back. Never jerk or shove an object that's too big or heavy to lift and carry. Do as the professionals do, even if it means going to a rental dealer and paying for the use of a dolly. Or hire one or two strapping youths to help with the job. It's the cheapest back insurance you can buy.

Family Safety
Summer 1967

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NATIONAL SAFETY COUNCIL DATA SHEETS

The National Safety Council has recently published new or revised technical data sheets on the subjects listed below. Copies of these data sheets (by the numbers shown in parentheses) may be obtained from the National Safety Council, 425 No. Michigan Avenue, Chicago, Illinois 60611.

Engine Lathes (264 Revised)
Operation of Power Shovels, Draglines, and Similar Equipment
(271 Revised)
Metal-Working Drill Presses (335 Revised)
Chlorine Dioxide (525 Revised)
Flexible Insulating Protective Equipment for Electrical Workers
(598)
Chippers and Hogs (602)

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SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

3rd QUARTER, 1957

PERIOD FROM JANUARY 1, 1957... THROUGH ~~SEPTEMBER~~ 30, 1957...

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL *		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Washington Office	364	530,272					
Denver Office	1,400	2,166,472	1		90	0.5	42
Alaska Power Administration	41	65,657	1		10	15.2	152
REGION 1							
Boise Regional Office	185	240,933					
Baker Project	37	49,038	1		14	20.4	285
Central Snake Project	42	57,303					
Chief Joseph Dam	33	51,689					
Columbia Basin Project	907	1,387,452	6		83	4.3	60
Green Springs Powerplant	2	2,905					
Hungry Horse Project	53	81,297					
Lower Columbia Development Office	43	60,981					
Mann Creek Project	14	23,532					
Minidoka Project	69	107,137					
Snake River Development Office	51	81,961					
Spokane Valley Project	20	35,461					
Third Powerplant	122	107,635	4		197	37.2	1,830
Upper Columbia Development Office	45	64,144					
Yakima Project	31	42,497	2		71	47.1	1,871
Totals & Averages	1,654	2,393,935	13		365	5.4	152
REGION 2							
Sacramento Regional Office	619	1,012,804					
Auburn-Folsom CVP Construction Office	104	127,051					
Cachuma Operations Field Branch	2	3,056					
Central Coast Dev. Field Branch	5	1,217					
Folsom Field Division	66	105,562					
Fresno Field Division	142	213,936					
Fresno CVP Construction Office	113	162,488					
Klamath Project Office	17	29,584					
Lahontan Basin Projects Office	66	71,244	1		30	14.0	421
Mesa Development Field Branch	3	8,848					
Red Bluff CVP Construction Office	62	100,360					
San Luis Unit CVP Construction Office	379	640,496	1		18	1.6	28
Shasta Field Division	133	201,592	1		5	5.0	25
Solano Operations Field Branch	2	3,056					
Tracy Field Division	163	256,660					
Transmission Lines Office, Reno	22	44,623					
Upper North Coast Dev. Field Branch	4	6,112					
Willows CVP Construction Office	105	167,406					
Totals & Averages	2,007	3,156,525	3		53	1.0	17
REGION 3							
Boulder City Regional Office	157	222,880					
Boulder Canyon Project Office	141	220,044	1		45	4.5	205
Boulder City Development Office	52	66,244	1		24	15.0	362
Dixie Project Office	4	25,530					
Lower Colorado River Control Office	24	35,628					
Cibola Field Division	109	161,415	3		300	18.6	1,859
Laguna Field Division	20	27,864					
Needles Field Division	54	72,527	1		52	13.8	717
Mead Construction Office	24	30,130					
Parker-Davis Project	319	488,184	3		140	6.1	287
Phoenix Development	82	121,844					
Yuma Projects Office	162	232,760					
Southern California Development Off.	41	55,908					
Totals & Averages	1,195	1,761,958	9		561	5.1	318
REGION 4							
Salt Lake City Regional Office	252	335,140					
Central Utah Project	208	283,647	1		19	3.5	63
CRSP Power Operations Office	308	485,082	1		100	2.1	206
Guerreant Unit	141	214,025					
Durango	38	49,163					
Grand Junction Projects Office	67	108,416					
Logan Development Office	8	14,920					
Lyman Project	36	42,780					
Seedskanie Project	13	31,878	1		240	31.4	7,528
Upper Green River	8	12,928					
Weber Basin	72	117,120					
Totals & Averages	1,151	1,695,099	3		358	1.8	211
REGION 5							
Amarillo Regional Office	112	171,086					
Albuquerque Development Office	33	51,131					
Arbuckle Project	8	16,910					
Austin Development Office	50	76,276					
Canadian River Project	60	113,614					
Lower Rio Grande Project	2	3,040			20	5.4	63
Middle Rio Grande Project	206	318,872	3				
Navajo Project	84	139,038					
Oklahoma City Development Office	21	27,215					
Pecos River Water Salvage Office	7	6,293					
Rio Grande Project	226	337,318	2		52	5.9	154
San Juan-Chama Project	78	130,027					
Totals & Averages	887	1,391,510	5		72	3.6	52
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

3rd QUARTER, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH September 30, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH September 3, 1967							
REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL*	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	189	267,110					
Canyon Ferry Project	21	26,604					
Fort Rock Project	40	50,324					
Missouri-Came Projects	191	271,720					
Missouri-Souris Projects	180	205,568	1		6	4.9	29
Power System Operations Office	42	61,040					
Piverton Project	5	136					
Yellowtail Project	60	110,729					
Upper Missouri Projects	104	159,230	1		4	6.3	25
Totals & Averages	812	1,169,359	2		10	1.7	9
REGION 7							
Denver Regional Office	226	340,120					
Springman-Arkansas Project	271	404,176	2		41	4.9	101
Olden River Unit	90	135,502					
Kansas River Projects	21	173,130					
Nebraska-Lower Platte Dev. Office	35	64,063					
North Platte River Projects	247	391,109					
South Platte River Projects	163	246,280					
Totals & Averages	1,123	1,760,293	2		41	1.1	23

*FATALITIES INCLUDED IN TOTAL DISABLING

JOB CORPS CONSERVATION CENTERS

Columbia Basin Job Corps Center							
Staff	54	156,592					
Corpsmen	199	753,112	2		8	2.6	10
Marsing Job Corps Center							
Staff	48	101,208					
Corpsmen	160	716,560					
Leviston Job Corps Center							
Staff (including 4 VISTAs)	55	255,512	2		13	7.4	51
Corpsmen	160	864,979	3	1	6,163	3.5	7,125
Toyon Job Corps Center							
Staff (including 2 VISTAs)	45	196,512	1			5.1	102
Corpsmen	135	521,440	1		20	1.9	10
Collbran Job Corps Center							
Staff (including 3 VISTAs)	41	54,742	1		8	18.3	746
Corpsmen	97	411,200	4		8	9.7	19
Weber Basin Job Corps Center							
Staff (including 1 VISTA)	58	91,800					
Corpsmen	253	919,568					
Arbuckle Job Corps Center							
Staff	28	132,256					
Corpsmen	121	472,447					
Casper Job Corps Center							
Staff	49	210,512	2		24	9.5	114
Corpsmen	169	747,376	1	1	6,175	1.3	8,262
McCook Job Corps Center							
Staff	47	202,140					
Corpsmen	110	722,032					
TOTAL STAFF	415	1,363,434	6		65	4.4	48
TOTAL VISTA	10	37,840					
TOTAL CORPSEMAN	1,404	6,206,914	11	2	12,359	1.8	1,991
CONSOLIDATED TOTALS							
	1,829	7,608,188	17	2	12,424	2.2	1,633
TOTALS LAST YEAR (1966)							
	1,566	8,196,522	33	1	6,220	4.0	759

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD
CUMULATIVE QUARTERLY REPORT
CONTRACTOR FORCES

3rd QUARTER, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH SEPTEMBER 30, 1967

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL #	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
DENVER OFFICE		2,522					
REGION 1							
Baker Project	143	141,567	3		14	21.3	99
Chief Joseph Dam	4	37,577	1		15	37.7	466
Columbia Basin Project	134	211,322	4		57	16.6	241
Hungry Horse Project		27,142					
Mann Creek Project	2	36,142					
Minidoka		1,137					
Snake River Development Office		1,094					
Spokane Valley Project		3,122					
Third Power Plant	111	25,371					
Yakima		3,122					
Totals & Averages	324	462,720			57	16.3	175
REGION 2							
Auburn-Folsom CVP Construction Office		74					
Fresno Field Division		3,717					
Fresno CVP Construction Office	32	11,077					
Klamath Project Office	4	1,124					
Lahontan Basin Projects Office	135	65,342					
Red Bluff CVP Construction Office	243	256,144					
San Luis Unit CVP Construction Off.	55	1,342,114	15		44	11.2	323
Tracy Field Division	7	4,556					
Transmission Lines Office, Reno		226					
Willows CVP Construction Office	231	150,170	2		47	10.6	248
Totals & Averages	1,512	1,957,302	17		487	8.7	249
REGION 3							
Boulder Canyon Project Office	5	2,463					
Gibola Field Division	34	54,376					
Head Construction Office	32	32,222					
Needles Field Division	2	1,607					
Parker-Davis Project Office	135	447,024	2		310	17.2	646
Yuma Projects Office	12	3,023	1		255	280.8	67,626
Totals & Averages	205	640,545	12		559	16.4	334
REGION 4							
Central Utah Project	211	132,290	1		10	7.5	85
CRIP Power Operations Office	22	22,377					
Curecanti Unit		22,222	2		295	7.5	354
Durango		1,405					
Grand Junction	14	25,500					
Lyman Project	66	44,123					
Seedskadee Project	21	24,147					
Weber Basin Project	6	1,123					
Totals & Averages	320	1,062,349	7		235	6.4	270
REGION 5							
Arbuckle Project	1	17,676					
Austin Development Office		1,734					
Canadian River Project	46	157,886	3		82	29.7	615
Navajo Project	177	222,253	14		1,201	46.7	4,004
Pecos River Water Salvage Office	24	14,533					
San Juan-Chama Project	474	143,151	7		773	9.4	1,063
Totals & Averages	722	1,171,526	24		2,046	27.5	1,746
REGION 6							
Fort Peck Project	6	3,226					
Missouri-Cahne Projects	17	5,134					
Missouri-Souris Projects	5	7,367					
Riverton Project	50	121,230					
Upper Missouri Projects	16	35,640	1		7	22.1	196
Yellowtail Project		160			47	5.8	47
Totals & Averages	127	173,545	2		7		
REGION 7							
Fryingpan-Arkansas Project	953	1,322,745	35		538	27.2	487
Glen Elder Unit	331	622,237	10	2	12,162	14.3	17,376
Kansas River Projects		17,117	1		14	59.4	504
Nebraska-Lower Platte Dev. Office		10,873					
North Platte River Projects	52	61,224					
South Platte River Projects		160					
Totals & Averages	1,336	2,112,710	47	2	12,714	22.2	5,618
CONSOLIDATED TOTALS	4,723	7,616,556	114	2	16,205	15.1	2,128
TOTALS LAST YEAR (1966)	5,168	14,476,443	194	13	98,137	13.4	6,779

*FATALITIES INCLUDED IN TOTAL DISABLING

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RECLAMATION SAFETY PROGRESS



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Annual Report 1967



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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SAFETY NEWS is published quarterly by the Office of
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accident prevention.

BUREAU SAFETY PERFORMANCE

1967 CUMULATIVE SAFETY RECORD
January 1 - December 31, 1967

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 2	0.3	1.2	21	1.5
Region 6	1.6	3.2	49	3.0
Region 4	2.1	1.3	160	1.2
Region 5	3.4	4.9	70	4.2
Region 1	5.2	4.3	122	4.7
Alaska	13.5	11.6	116	16.4
Region 7	33.8	1.3	2,601	3.7
Region 3	<u>202.0</u>	<u>6.8</u>	<u>2,970</u>	<u>2.9</u>
Totals to Date	18.0	2.7	665	3.1
Totals 1966	19.9	2.3	864	3.1

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	1.6	4.7	33	0
Region 1	30.8	15.5	199	0
Region 2	33.5	10.3	325	0
Region 3	124.0	16.0	775	0
Region 5	248.8	18.5	1,345	0
Region 4	393.9	9.0	4,377	1
Region 7	<u>1,910.9</u>	<u>21.5</u>	<u>8,888</u>	<u>4</u>
Totals to Date	524.7	15.2	3,452	5
Totals 1966	908.4	13.4	6,779	13

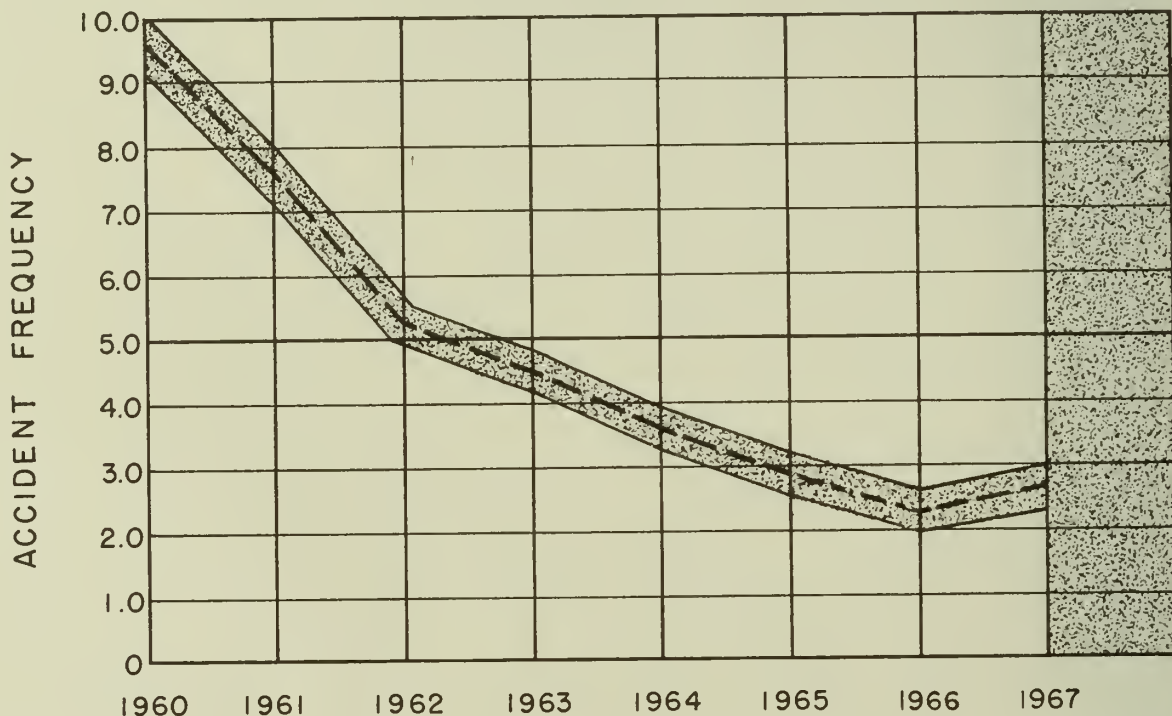
BUREAU CONTRACTORS' 3-YEAR AVERAGE (1965-1967)

Frequency rate 14.2
Severity rate 4,749

C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate 2.3
Severity rate 1,254
Vehicle accident rate 29.7

GOVERNMENT FORCES



TREND and OUTLOOK

BUREAU-WIDE -- In 1967, for the seventh consecutive year, Reclamation has achieved a commendable accident record. During the year, Bureau employees worked over 21 million man-hours with only 57 disabling injuries, resulting in a cumulative accident frequency rate of 2.7. The 25 percent reduction in the accident frequency rate, as compared with calendar year 1964, represents another milestone toward achieving and maintaining the 30 percent reduction envisioned by Mission SAFETY-70 by 1970. Reclamation enjoyed a 22 percent reduction in 1965, the year President Lyndon B. Johnson announced the Mission SAFETY-70 program, and a 36 percent reduction in 1966.

While there was a reduction in the severity rate, 665 as compared with 864 in 1966, the record is less than satisfactory in this respect. Two Bureau employees were fatally injured while performing their

work in 1967. As a result, 1967 cannot be considered truly satisfactory from the standpoint of safety achievement. In the final analysis, the ability to perform our work without serious injury or death has to be the requisite for ultimate achievement in safety.

REGIONAL -- Several Regions achieved exemplary accident records, reflected in low accident frequency rates, together with the absence of fatal or serious injuries. Regions 2, 4, and 6 enjoyed both frequency and severity rates considerably below the Bureau-wide averages. The best safety record was achieved by Region 2 with an accident frequency rate of 1.2 and a severity rate of 21 days lost per million man-hours worked during 1967. Based upon this exemplary record, Region 2 earned the Commissioner's Award for 1967.

WORK ACTIVITY -- Administrative services again led with the best safety performance: Frequency 0.6 and severity 23. Project Investigation and Construction Administration achieved commendable safety records, while Irrigation and Power Operation and Maintenance activities experienced the highest accident rates. Since the latter has been true for the past several years, it is obvious that our efforts must be directed toward the improvement of the safety record in Irrigation and Power Operation and Maintenance activities.

VEHICLE ACCIDENTS -- Bureau vehicle operators drove over 38 million miles, were involved in 117 vehicle accidents, which resulted in the exemplary vehicle accident frequency rate of 3.1 accidents per million miles. For 6 consecutive years, Reclamation has enjoyed a vehicle accident frequency rate of less than 3.5. Bureau vehicle accident experience compares favorably with the latest 3-year average of 12.68 experienced by Government agencies and companies reporting to the National Safety Council. Our participation in the National Safety Council Driver Improvement Program and the emphasis placed on safe and responsible operation of Government vehicles are obviously responsible for the continuance of this remarkable achievement.

FIRE PREVENTION -- Reclamation suffered only four minor fires during 1967, resulting in an estimated property loss of \$8,362. We can be justly proud of the results of the effective fire prevention and protection efforts carried out throughout Reclamation, particularly in our Job Corps Conservation Centers, where no fire losses occurred.

PROPERTY DAMAGE -- Reportable property damage from accidental causes, other than vehicle accidents, amounted to \$6,024. (This figure largely represents the amount of property damage resulting from accidents involving personal injury, and is not an accurate indication of the amount of property damage resulting from all accidental causes.)

PUBLIC SAFETY -- During calendar year 1967, 69 public drownings occurred on Bureau-constructed facilities operated by Reclamation, irrigation districts, state and county recreational agencies. Nineteen of these drownings occurred on Bureau-operated canals and reservoirs as compared with 15, 25, and 22 in 1966, 1965, and 1964, respectively. Considering the increasing public exposure on our lakes and reservoirs--over 45 million visitor days in 1967--we believe this is a commendable record. This achievement reflects the efforts of our regional and operating offices to waterproof the public through Reclamation's "Operation Westwide" program.

JOB CORPS CENTERS -- The accident frequency rate of 2.3 represents an improvement over the frequency rate of 4.0 reported in 1966. While the vehicle accident frequency rate of 29.7 is an improvement over last year's rate of 33.1, it is still unsatisfactory. The administration of Reclamation Job Corps Conservation Centers is continuing to improve, as is the effectiveness of the center safety programs. Considering the numerous problems associated with undertaking this new and challenging activity, there have been some outstanding safety achievements. For example, two Job Corps Conservation Centers--namely, the Weber Basin Center and the McCook Center--were presented Department of the Interior Safety Achievement Awards for compiling more than 2,000,000 man-hours each without a disabling injury. This commendable achievement reflects a continuous period of 2 years' operation without a lost-time injury on the part of each center mentioned.

ACCOMPLISHMENTS

Following is a summarization of special accomplishments and highlights of specific accident prevention projects undertaken or continued by Reclamation during calendar year 1967.

SAFETY TRAINING -- Safety indoctrination and training is the cornerstone upon which successful safety programs are built. Recognizing this fact, Reclamation continued to provide training for vehicle operators, construction inspection personnel, and others under the following established training programs: During 1967, an additional 1,222 employees successfully completed the 10-hour National Safety Council Driver Improvement Program, bringing the total to 8,296 since the inception of the course in 1965. To date 1,114 construction supervisors and inspectors have completed the 30-hour Safety Training Course for Construction Supervisors; 327 completed this training in 1967, and at the end of the year 101 employees were undergoing this training. Also during the year, 1,369 Bureau employees completed either a Bureau of Mines or American Red Cross course in first aid. These training programs, while sponsored by the Regions, are conducted in Bureau field offices by qualified instructors.

In October 1967 a program was initiated to train non-Bureau electricians and linemen for work in Reclamation-owned substations. This program, conducted by Bureau electrical operation and maintenance supervisors, includes instruction in the safety requirements set forth in Reclamation's Power System Safety Handbook.

PHYSICAL FITNESS PROGRAM -- During 1967, the Columbia Basin Project initiated a physical fitness qualifications program. The program, in addition to requiring pre-employment medical examinations, provides for periodic physical examination of employees engaged in hazardous occupations or in jobs where ill health or physical limitations could endanger themselves or others. The program also provides a reliable means of determining whether or not an employee possesses the physical ability to perform his assigned work. The program's objective is to establish a reliable control system to identify, evaluate, and determine the feasibility of alternative actions available to employees whose health obstructs effective accomplishment of their work or constitutes a significant safety hazard.

The examinations are conducted by a reputable industrial medicine clinic and, in turn, are reviewed and evaluated by project supervisors, including the Safety Officer and the Personnel Officer. To date the results have proven beneficial to both the Bureau and the employees. In addition to advancing safety, the program improves job performance and personally benefits the employees -- in some cases adding years to their period of gainful employment through the early detection of disease or physical impairment.

Depending upon the success of the program on the Columbia Basin Project and in Region 1, consideration will be given toward adoption of a similar program Bureau-wide.

CONSTRUCTION SAFETY -- A safety program, to be successful, must be able to cope with the new techniques and innovations developed within the specific industry. Safety methods and standards must be readily susceptible to change and improvement. In order to meet this challenge, Reclamation has revised the construction safety requirements published in Safety Requirements for Construction by Contract. Among the improvements made are provisions for equipping high-speed off-highway earthmoving equipment with rollover protection and emergency braking systems. Reclamation safety standards were revised with the cooperation of The Associated General Contractors of America, the Society of Automotive Engineers, manufacturers of construction equipment, labor, and others interested in the improvement of safety in the construction industry.

VEHICLE SAFETY -- Region 2 and the Transmission Lines Office, Reno, Nevada, conducted an exhaustive study of the hazards incident to overloading 4x4 carryalls. The study dealt with the procurement, utilization, operation and maintenance of these vehicles, both from the standpoint of economy and of safety. The results of this study were reported to the Automotive Standards Division of General Services Administration and to the Department. Utilization of the data contained in this report could result in improved safety, together with savings in vehicle repair and maintenance costs.

PUBLIC SAFETY -- Within Reclamation there has been a continuing and increasing concern over drownings in Bureau constructed canals. As a result, we are studying the feasibility of converting open canals to closed conduits in an endeavor to reduce the hazard. Investigations and studies pertinent to such consideration were initiated in 1967 and are continuing.

CONCLUSION -- The above represents but a few of the specific projects being carried out by our regional and operating offices in an endeavor to improve Reclamation's safety effort. A few of the others are: Technical studies to reduce the hazard in energized substations and to cope with the hazard of electromagnetic and electrostatic voltage buildup in transmission line construction; improvement in our safety goggle program; development of an effective fire protection and prevention program for our Job Corps Conservation Centers; improvement in our accident investigation and reporting procedures and closer coordination of these activities with legal and tort claim representatives; initiation of a program to cope with noise control problems in Bureau installations, etc.

The above accomplishments and undertakings typify Reclamation's belief in the concept that effective safety is good business: And that safety is simply another function of management and must be considered in all management decisions relating to the method of doing business. The success of Reclamation's safety program holds forth continued realization of cost reduction and greater manpower utilization through the reduction of personal injury and damage losses by the elimination of accidents.

OUTLOOK

Our experience in 1966 and 1967 clearly indicates that it is becoming increasingly difficult to make significant reductions in the accident frequency rate. In fact, for the past 2 years we have just barely held the line. On the other hand, the severity rates, reflecting serious and fatal injuries, can and must be reduced. Greater

emphasis must be placed upon safety awareness and full compliance with established Bureau safety policy and requirements, particularly in Power and Irrigation O&M activities. A good safety record is simply the product of efficient and capable management. Conversely, a poor safety record reflects adversely on the ability of management to perform efficiently, with a minimum of accidental damage, interruption and delay which add to our cost of doing business. Further improvement will be largely dependent upon our acceptance of, and dedication to, the following established policy and concept of management leadership.

POLICY -- "It is the policy of the Bureau to initiate and carry out a vigorous and effective safety program which is essential to maximum utilization of personnel, equipment, and funds. Each Bureau employee is expected to perform his respective duties in a manner which is consistent with the highest standards of health and safety. Observance of applicable health and safety measures--including the provisions published in Reclamation Instructions, Part 365 Safety--Federal, State and local safety codes and regulations is mandatory. Active participation in the Bureau's safety effort is considered an essential responsibility of all Bureau supervisory personnel. Supervisory responsibility to maintain the highest standards of health and safety extends to provisions for protection of the public and contractor personnel." BUREAU POLICY PLACES FULL RESPONSIBILITY FOR OBTAINMENT OF EFFECTIVE ACCIDENT PREVENTION RESULTS UPON LINE MANAGEMENT AT EVERY LEVEL OF OPERATION.

MANAGEMENT LEADERSHIP -- If Reclamation is to remain in the forefront of those enjoying successful safety records, management must continue to provide the motivation. Supervisors must generate a sincere sense of mission and breathe new life into their safety efforts. Every employee must be made to feel the persuasive sensation of pressure to perform safely and to improve the safety record. The following remarks by Commissioner Dominy are as appropriate today as when he first voiced them in 1963: "It is due largely to your dedication and under your guidance that accident costs are reduced, full utilization of manpower is assured, and the American public is able to enjoy our popular recreation areas with safety. Your past accomplishments have been a source of benefit, of pride and pleasure to the Nation, your Bureau, and to the Department. However, now is the time for greater dedication, enlarged efforts, and further achievement. Safety is an unending responsibility of management."

THE RECORD

The following accident statistical tabulations indicate areas of strength and weakness and should be helpful in directing our efforts to specific locations, operations, and phases of accident prevention requiring improvement.

WORK ACTIVITY - BUREAU-WIDE

<u>Type of work</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration	8,918,737	5	209	0.6	23
Construction	3,982,262	18	935	4.5	235
Investigations	2,168,374	4	275	1.8	127
Irrigation O&M	2,697,609	17	6,306	6.3	2,338
Power O&M	<u>3,574,451</u>	<u>13</u>	<u>6,457</u>	<u>3.6</u>	<u>1,806</u>
1967 Totals	21,341,433	57	14,182	2.7	665
1966 Totals	22,443,024	51	19,385	2.3	864

ORGANIZATIONAL UNIT

Washington Office

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
1967 Totals	708,752	0	0	0.0	0
1966 Totals	615,792	0	0	0.0	0

Denver Office

1967 Totals	2,860,888	1	125	0.3	44
1966 Totals	3,001,232	2	9	0.7	3

Alaska Power Administration

Investigations	47,839				
Power O&M	<u>38,369</u>	<u>1</u>	<u>10</u>	<u>26.1</u>	<u>261</u>
1967 Totals	86,208	1	10	11.6	116
1966 Totals	87,327	0	0	0.0	0

Region 1

Major activity	Man-hour exposure	Disabling injuries	Days lost	Frequency rate	Severity rate
Administration	640,556	1	5	1.6	8
Construction	554,446	5	211	9.0	381
Investigations	342,854				
Irrigation O&M	846,209	6	140	7.1	165
Power O&M	<u>835,929</u>	<u>2</u>	<u>36</u>	<u>2.4</u>	<u>43</u>
1967 Totals	3,219,994	14	392	4.3	122
1966 Totals	3,001,218	15	6,565	5.0	2,187

Region 2

Administration	1,077,084	0	0	0.0	0
Construction	1,280,078	3	53	2.3	41
Investigation	568,696	0	0	0.0	0
Irrigation O&M	649,419	1	30	1.5	46
Power O&M	<u>581,310</u>	<u>1</u>	<u>5</u>	<u>1.7</u>	<u>9</u>
1967 Totals	4,156,587	5	88	1.2	21
1966 Totals	4,521,065	7	149	1.5	33

Region 3

Administration	658,202	1	50	1.5	76
Construction	456,144	6	369	13.2	809
Investigations	321,678	2	241	6.2	749
Irrigation O&M	170,360	1	18	5.9	106
Power O&M	<u>737,946</u>	<u>6</u>	<u>6,285</u>	<u>8.1</u>	<u>8,517</u>
1967 Totals	2,344,330	16	6,963	6.8	2,970
1966 Totals	2,450,036	1	50	0.4	20

Region 4

Administration	1,156,912	0	0	0.0	0
Construction	494,649	1	240	2.0	485
Investigations	163,214	0	0	0.0	0
Irrigation O&M	90,051	0	0	0.0	0
Power O&M	<u>338,546</u>	<u>1</u>	<u>100</u>	<u>3.0</u>	<u>295</u>
1967 Totals	2,243,372	3	358	1.3	160
1966 Totals	2,599,833	3	6,091	1.2	2,343

Region 5

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration	447,090	1	11	2.2	25
Construction	398,966	0	0	0.0	0
Investigations	206,846	0	0	0.0	0
Irrigation O&M	707,410	8	118	11.3	17
Power O&M	<u>75,861</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1967 Totals	1,836,173	9	129	4.9	70
1966 Totals	2,029,764	10	301	4.9	148

Region 6

Administration	549,187	0	0	0.0	0
Construction	242,824	1	21	4.1	86
Investigations	291,905	2	34	6.9	116
Irrigation O&M	115,024	0	0	0.0	0
Power O&M	<u>363,923</u>	<u>2</u>	<u>21</u>	<u>5.5</u>	<u>58</u>
1967 Totals	1,562,863	5	76	3.2	49
1966 Totals	1,588,565	7	6,098	4.4	3,839

Region 7

Administration	820,066	0	0	0.0	0
Construction	555,155	2	41	3.6	74
Investigations	225,342	0	0	0.0	0
Irrigation O&M	119,136	1	6,000	8.4	5,036
Power O&M	<u>602,567</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1967 Totals	2,322,266	3	6,041	1.3	2,601
1966 Totals	2,548,192	6	122	2.4	48

ANALYSIS OF DISABLING INJURIES

In the following tables we have classified the 57 disabling injuries suffered during 1967 by operation, occupation, and other classification criteria pertinent to the analysis of injury experience:

OPERATION	No. of <u>injuries</u>
Administration	5
Construction	18
Investigation	4
O&M Irrigation	17
O&M Power	<u>13</u>
Total	57

OCCUPATION	
Administrative, Office and Clerical	5
Field Engineering and Surveys	9
Electricians, Linemen and Groundmen	8
Irrigation Systems Operation	7
Marine Operations	5
Drill Operators	6
Construction Inspectors	2
Maintenancemen	4
Mechanics	2
Laborers	2
Student Aids	1
Other	<u>6</u>
Total	57

AGE GROUP	
Under 18 years of age	1
18-25 years	7
26-40 years	12
41-60 years	33
Over 60 years of age	<u>4</u>
Total	57

Government Forces
January 1 - December 31, 1967

DISABLING WORK INJURIES

By Regions and by Part of Body Injured

<u>Part injured</u>	<u>*Days lost</u>	<u>Total disabling injuries</u>	<u>Alaska</u>	<u>Denver Office</u>	<u>Regions</u>						
					<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Head	9	1			1						
Neck	129	2		1	1						
Wrist	45	1					1				
Hand	13	1			1						
Fingers	792	7			3		2	2			
Abdomen	258	7			1		3		2	1	
Back	191	10	1		3	1	1		2	1	1
Ribs, chest	29	3			1	1			1		
Thigh	5	1					1				
Leg, ankle	169	9					4	1	3	1	
Knee	242	5			2		1		1		1
Foot	49	2					1			1	
Internal and multiple	12,251	8			1	3	2			1	1
Totals	14,182	57	1	1	14	5	16	3	9	5	3

*Includes scheduled charges.

TIME EXTENT OF INJURY

	<u>No. of injuries</u>	<u>Days lost</u>
Temporary total disability	49	1,397
Permanent partial disability	6	785
Fatals	<u>2</u>	<u>12,000</u>
Total	57	14,182

SERIOUS OR FATAL INJURIES

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
1-26-67	Drill Operator	Operating machinery	135*
3-30-67	Drill Operator	Handling equipment	50*
8-7-67	Foreman Lineman	Handling equipment	100*
9-22-67	Maintenanceman	Operating machinery	240*
11-29-67	Drill Operator	Handling equipment	210*
10-25-67	Lineman	Electrocution	6,000*
11-21-67	Reservoir Sup't.	Operating machinery	6,000*

*Fixed time and charge.

Government Forces
January 1 - December 31, 1967

NONDISABLING WORK INJURIES

By Regions and By Part of Body Injured

<u>Part injured</u>	<u>Total</u>	<u>Alaska</u>	<u>Denver Office*</u>	<u>Regions</u>						
				1	2	3	4	5	6	7
Total**	529	1	18	106	132	88	51	52	31	50
Ear	7			2	1	2	2			
Eye	65			17	13	15	6	5	4	5
Head	32		2	8	6	7	3	1	1	4
Neck	12			3	1	2	2		1	2
Upper arm	3	1	1		1					
Lower arm	14		1	2	4	3	1		1	2
Elbow	14		3	4	2		2	1	1	1
Wrist	12		2	2	5	2	1			
Hand	30		1	1	8	7	4	6		3
Fingers	91		4	18	21	12	10	7	6	13
Abdomen	12			2	2	1	2	3		2
Back	62			14	10	15	8	8	4	3
Hips	7			2	2	2				1
Shoulders	13	1		4	3	1		3		1
Ribs, chest	21		1	4	3	7	2	4		
Thigh	12			2	2	3		2		3
Leg, ankle	36			9	6	3	4	6	4	4
Knee	24		2	6	1	5	4	2	1	3
Foot	22		2	3	7	3	1	4	2	
Toes	12		1	3		2		3	1	2
Respiratory system	8			3		1	1	1		2
Poison oak or ivy***	40				35				5	

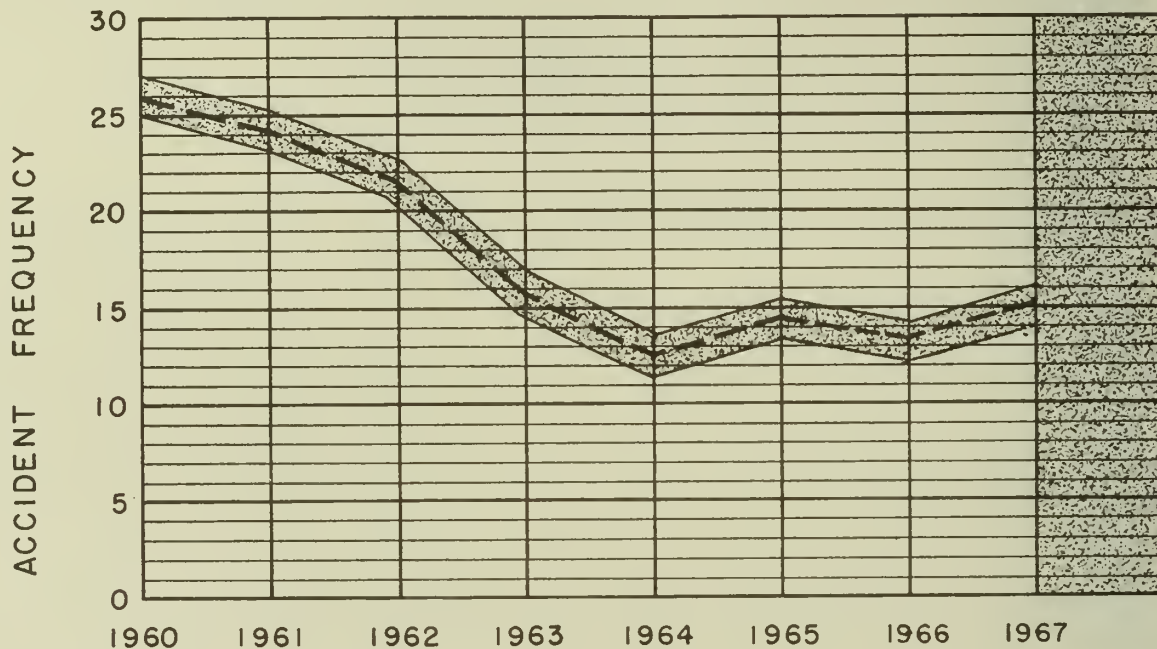
*Includes one nondisabling injury from the Washington Office.

**Columns will not equal totals where an accident involved an injury to more than one body part.

***Not shown by body part.

Nondisabling work injuries listed above involved medical expense but no chargeable lost time.

CONTRACTOR FORCES



TREND and OUTLOOK

BUREAU-WIDE -- Bureau contractor employees worked over 10 million man-hours, suffered 155 disabling injuries, and suffered 5 fatalities.

Considering the hazardous nature of the work and the fact that the preponderance of the man-hour exposure was in the construction of dams and tunnels, this is a commendable achievement. The following comparison of Bureau contractor accident statistics with those available from the Bureau of Labor Statistics would appear to substantiate this claim:

Activity	Reclamation 1967		*Industry-wide 1961	
	Frequency rate	Severity rate	Frequency rate	Severity rate
Dams	13.5	5,486	20.7	7,041
Tunnels	24.4	1,071	56.8	15,326
Powerlines	13.3	498	28.8	9,845

*Latest figures available based upon a report compiled by the Bureau of Labor Statistics dated June 1967.

The record achieved by Reclamation contractors is evidence of the improvement in accident prevention being made by responsible contractors. It is also reflective of the emphasis being placed on safety and compliance with Bureau construction safety requirements by those administering Reclamation's construction program. The current revision of Safety Requirements for Construction by Contract, incorporating improved safety techniques to cope with the hazards incident to the operation of heavy equipment should further improve the record.

It should be emphasized that individual contractors and contractor associations are cooperating with Reclamation in the development of practical safety standards and improved safety programs in an endeavor to reduce accidents in the industry. Fortunately, more and more contractors are realizing that safety is good business and must be considered an integral and inseparable part of every operation. They are equally aware of the consequences of a poor record: The appalling loss of life, the financial impact of accidents on the cost of production, the inroads made on profits, and the threat of punitive legislation. As a result, there is a growing awareness on the part of both Management and Labor of the need for intensified safety education and training to insure compliance with industry safety standards.

Realizing the shortcomings of safety legislation predicated on enforcement by third parties, Reclamation prefers to continue to consider safety as a contractual obligation, and to cooperate with the contractors and labor in the development of relevant construction safety standards and improved safety program techniques. The logic of this concept is borne out by the exemplary safety records being achieved by many Bureau contractors performing inherently hazardous work.

Based upon past experience and contingent upon the continued support and participation of the contractors and labor, we can look to the future with increased optimism. The conservation of life, time and money -- all desired objectives of Reclamation and the construction industry -- is contingent upon the success of this joint effort.

THE RECORD

WORK ACTIVITY - CONTRACTOR FORCES

<u>Type of work</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	2,248,604	23	6,733	10.2	2,994
Concrete dams	960,600	8	293	8.3	305
Earth dams	2,512,791	39	18,761	15.5	7,477
Tunnels	2,375,649	58	2,545	24.4	1,071
Transmission lines and substations	1,206,092	16	601	13.3	498
Miscellaneous	<u>914,937</u>	<u>11</u>	<u>6,338</u>	<u>12.0</u>	<u>6,927</u>
1967 Totals	10,218,673	155	35,271	15.2	3,452
1966 Totals	14,476,443	194	98,137	13.4	6,779

ORGANIZATIONAL UNIT

Region 1

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	392,498	6	89	15.3	227
Concrete dams	6,363	0	0	0.0	0
Earth dams	151,474	2	14	13.2	92
Tunnels	47,492	0	0	0.0	0
Transmission lines and substations	86,152	1	15	11.6	174
Miscellaneous	<u>25,692</u>	<u>2</u>	<u>23</u>	<u>77.8</u>	<u>895</u>
1967 Totals	709,672	11	141	15.5	199
1966 Totals	773,646	16	6,261	20.7	8,093

Region 2

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	1, 436, 436	11	283	7.7	197
Earth dams	340, 729	2	51	5.9	150
Tunnels	322, 713	10	228	31.0	707
Transmission lines and substations	306, 819	2	225	6.5	733
Miscellaneous	<u>227, 014</u>	<u>2</u>	<u>70</u>	<u>8.8</u>	<u>308</u>
1967 Totals	2, 633, 711	27	857	10.3	325
1966 Totals	4, 859, 094	56	25, 131	11.5	5, 172

Region 3

Canals	92, 180	1	250	10.8	2, 712
Transmission lines and substations	620, 857	11	333	17.7	536
Miscellaneous	<u>38, 846</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1967 Totals	751, 883	12	583	16.0	775
1966 Totals	489, 753	8	3, 208	16.3	6, 650

Region 4

Canals	13, 509	0	0	0.0	0
Concrete dams	832, 830	8	293	9.6	352
Earth dams	490, 283	4	6, 025	8.2	12, 289
Tunnels	61, 395	1	14	16.3	228
Transmission lines and substations	17, 926	0	0	0.0	0
Miscellaneous	<u>30, 752</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1967 Totals	1, 446, 695	13	6, 332	9.0	4, 377
1966 Totals	2, 191, 537	21	13, 049	9.6	5, 954

Region 5

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	219,383	4	111	18.2	506
Earth dams	59,207	2	38	33.8	642
Tunnels	1,268,150	23	1,998	18.1	1,576
Miscellaneous	<u>75,815</u>	<u>1</u>	<u>36</u>	<u>13.2</u>	<u>475</u>
1967 Totals	1,622,555	30	2,183	18.5	1,345
1966 Totals	2,580,782	35	14,443	13.6	5,596

Region 6

Canals	26,321	0	0	0.0	0
Concrete dams	121,407	0	0	0.0	0
Earth dams	1,476	0	0	0.0	0
Transmission lines and substations	19,306	0	0	0.0	0
Miscellaneous	<u>44,376</u>	<u>1</u>	<u>7</u>	<u>22.5</u>	<u>158</u>
1967 Totals	212,886	1	7	4.7	33
1966 Totals	718,041	15	233	20.9	324

Region 7

Canals	68,277	1	6,000	14.6	87,877
Earth dams	1,469,622	29	12,633	19.7	8,596
Tunnels	675,898	24	305	35.5	451
Transmission lines and substations	155,032	2	28	12.9	181
Miscellaneous	<u>462,930</u>	<u>5</u>	<u>6,202</u>	<u>10.8</u>	<u>13,397</u>
1967 Totals	2,831,759	61	25,168	21.5	8,888
1966 Totals	2,603,104	43	35,812	16.5	13,757

Denver Office

Miscellaneous	9,512	0	0	0.0	0
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RECLAMATION JOB CORPS CENTERS

1967 CUMULATIVE ACCIDENT RECORD

<u>Region</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Region 1	2, 287, 780	3	11	1.3	5
Region 2	2, 424, 983	9	6, 208	3.7	2, 560
Region 4	1, 966, 318	7	69	3.6	35
Region 5	803, 463	0	0	0.0	0
Region 7	<u>2, 475, 848</u>	<u>4</u>	<u>6, 199</u>	<u>1.6</u>	<u>2, 504</u>
Totals	9, 958, 392	23	12, 487	2.3	1, 254

SERIOUS ACCIDENTS OR FATALITIES

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
5-14-67	Job Corps enrollee	Accidentally drowned while swimming	6, 000*
7-25-67	Job Corps enrollee	Accidentally drowned while swimming	6, 000*

*Fixed time charge for fatality.

VEHICLE ACCIDENT EXPERIENCE

<u>Region</u>	<u>No. of accidents</u>	<u>Mileage</u>	<u>Accident rate</u>	<u>Estimated damage</u>
Region 1	17	657, 396	25.9	\$ 4, 827
Region 2	9	468, 971	19.2	3, 325
Region 4	15	682, 743	22.0	7, 574
Region 5	5	144, 483	34.6	1, 002
Region 7	<u>30</u>	<u>608, 371</u>	<u>49.3</u>	<u>5, 335</u>
Totals	76	2, 561, 964	29.7	\$22, 063

Vehicle accidents involving Job Corps staff: 22

Vehicle accidents involving Job Corps enrollees: 54

* * * * *

VEHICLE ACCIDENTS

THE FOLLOWING TABLE SHOWS BUREAU VEHICLE ACCIDENT EXPERIENCE SINCE 1958:

<u>Year</u>	<u>No. of accidents</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
1967	117	3.1	\$32,582
1966	125	3.1	26,771
1965	116	2.9	23,205
1964	114	2.8	36,410
1963	134	3.4	25,130
1962	125	3.4	33,100
1961	151	4.6	41,255
1960	75	2.7	32,960
1959	93	3.3	34,940
1958	146	4.9	37,980

*Number of accidents per million miles driven.

THE FOLLOWING TABLE COMPARES THE VEHICLE ACCIDENT EXPERIENCE OF MAJOR ORGANIZATIONAL UNITS OF RECLAMATION FOR CALENDAR YEAR 1967:

<u>Region</u>	<u>No. of accidents</u>	<u>Mileage</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
Alaska District	1	54,741	16.4	\$ 215
Denver Office	4	418,324	9.6	296
Region 1	29	6,058,341	4.7	8,107
Region 2	14	9,267,212	1.5	5,114
Region 3	13	4,449,903	2.9	9,494
Region 4	5	4,063,413	1.2	676
Region 5	21	5,049,681	4.2	3,924
Region 6	12	4,046,862	3.0	1,398
Region 7	18	4,866,998	3.7	3,358
Totals	117	38,275,475	3.1	\$32,582
1966 Bureau Totals	125	40,922,921	3.1	\$26,771

*Number of accidents per million miles driven.

Note: Estimated damage covers only the cost of repair or replacement of the Government vehicle involved.

ACCIDENT COSTS

Accidents do not always involve personal injury to employees but may result in the destruction or loss of property and third-party claims. Consideration and review of costs resulting from accidents is essential to the appraisal of any accident prevention program. The following summary of estimated accident costs for calendar years 1967, 1966, 1965, and 1964 is presented for this purpose:

<u>Type of accident</u>	<u>1967</u>	<u>Estimated cost</u>		<u>1964</u>
		<u>1966</u>	<u>1965</u>	
Work injuries ^{1/}				
Disabling injuries	\$ 39,490	\$ 33,000	\$ 39,488	\$ 54,351
Nondisabling injuries	8,464	7,920	10,096	8,120
Fatal injuries	124,144	57,038	52,825	159,507
Fires	8,362	55,261	3,340	166,160
Tort claims ^{2/}	148,327	27,027	4,439	62,508
Employee claims		207		
Motor vehicle accidents	32,582	26,771	23,205	24,681
Other property damage	<u>6,024</u>	<u>2,232</u>	<u>16,054</u>	<u>2,069</u>
Totals	\$367,393	\$209,456	\$149,447	\$477,396

^{1/}Cost estimate based on past 5-year average cost.

^{2/}Tort claims resulting from accidents adjudicated during 1964, 1965, 1966, and 1967.

The costs shown are estimated direct costs resulting from accidents.

STUDIES CONDUCTED BY COMPETENT AND
RECOGNIZED AUTHORITIES INDICATE THAT
INDIRECT ACCIDENT COSTS EXCEED DIRECT
ACCIDENT COSTS BY A RATIO OF 4:1

PUBLIC SAFETY

RECORD OF PUBLIC DROWNINGS

<u>Bureau-operated Facilities:</u>	<u>CY67</u>	<u>CY66</u>	<u>CY65</u>
Canals	15	14	22
Dams	0	0	0
Reservoirs	4	1	3
Total	<u>19</u>	<u>15</u>	<u>25</u>

Facilities Operated by Others:

Irrigation and Water Districts	13	15	14
State or County (Recreational)	37	19	39
Total	<u>50</u>	<u>34</u>	<u>53</u>

Summary of Total Drownings During Period:

By Operating Agency:

Bureau of Reclamation	19	15	25
Irrigation and Water Districts	13	15	14
State or County (Recreational)	37	19	39
Total	<u>69</u>	<u>49</u>	<u>78</u>

By Type of Facility:

Canals	24	27	34
Dams	2	0	0
Reservoirs	43	22	44
Total	<u>69</u>	<u>49</u>	<u>78</u>

By Activity:

Swimming	21	15	23
Boating	13	6	14
Fishing	0	2	7
Fell into water	20	19	24
Other	15	7	10
Total	<u>69</u>	<u>49</u>	<u>78</u>

By Age:

Under 12 years of age	13	19	19
From 12 to 25	24	12	22
From 25 to 50	22	10	23
Over 50 years of age	10	8	14
Total	<u>69</u>	<u>49</u>	<u>78</u>

SAFETY AWARDS

BUREAU OF RECLAMATION

RECEIVES SPECIAL COMMENDATION

The Bureau of Reclamation received the following letter from George E. Robinson, Deputy Assistant Secretary for Administration, Department of the Interior, recognizing the Bureau's safety accomplishments during 1966:

The Bureau of Reclamation has been selected to receive a special commendation for its significant and impressive safety accomplishments during 1966. This selection was made by the Department of the Interior Safety Award Committee.

For the sixth consecutive year, the Bureau achieved in 1966 the lowest work injury frequency rate in its 64-year history. During the same period, Bureau employees worked over 22 million man-hours with only 51 disabling injuries. This continuing reduction in the accident frequency rate attests to the fact that safety efforts are basically realistic and effective. This commendable record could not have been achieved without the dedicated participation and involvement of every individual in the safety program.

On behalf of the Safety Award Committee and the Department, I would like to extend my personal congratulations to you, members of your staff, and all bureau safety personnel, for contributions that have been made to the total safety effort during the past 6 years.

COMMISSIONER'S ANNUAL SAFETY AWARD - 1967

Presented to Region 2, Sacramento, California, in recognition of the best safety record for Government forces during calendar year 1967.

NATIONAL SAFETY COUNCIL AWARDS

AWARD OF HONOR (1966)

Region 2--Sacramento, California
Region 3--Boulder City, Nevada
Region 7--Denver, Colorado

AWARD OF MERIT (1966)

Bureau of Reclamation--Bureau-wide
Region 5--Amarillo, Texas

The Alaska District (now the Alaska Power Administration) was presented a special Certificate of Commendation in recognition of the fact that no disabling injuries were experienced during the period, March 10, 1965, through December 31, 1966.



Mr. R. W. Cary (left above) Regional Safety Officer, Sacramento, California, presenting a replica of the National Safety Council's "Award of Honor" to Mr. H. E. Horton, Project Construction Engineer for the Willows CVP Construction Office. Replicas of this award were presented to each office in the Region for their contribution in achieving this high honor. Photo P602-200-2582 NA



Regional Safety Committee, Region 7, Denver, Colorado, on occasion of the Region receiving a National Safety Council "Award of Honor" for "An Outstanding Safety Performance in 1966." Shown above, left to right: G. D. Winans, Regional Safety Engineer; H. O. Caperton, Regional Supervisor of Power; L. E. Kern, Regional Procurement and Property Officer and Chairman of the Committee; C. W. Griffin, Regional Engineer; and R. B. Eggen, Agriculturist. The sixth member of the Committee, W. J. Hayes, Head of Field Surveys in the Division of Project Development, was not available when the picture was taken. Photo PX-D-60314

THE DEPARTMENT OF THE INTERIOR'S
CERTIFICATE OF SAFETY ACHIEVEMENT AWARD--1967

In recognition of over 500,000 man-hours without a disabling injury:

CRSP Power Operations Office--Montrose, Colorado
San Juan-Chama Project--Santa Fe, New Mexico
South Platte River Projects--Loveland, Colorado
Willows CVP Construction Office--Willows, California

In recognition of over 1,000,000 man-hours without a disabling injury:

North Platte River Projects--Casper, Wyoming
Tracy Field Division--Tracy, California

In recognition of over 2,000,000 man-hours without a disabling injury:

McCook Job Corps Conservation Center--McCook, Nebraska
Weber Basin Job Corps Conservation Center--Ogden, Utah

In recognition of over 500,000 accident-free miles:

CRSP Glen Canyon Field Division--Page, Arizona
Fresno Field Division--Fresno, California
Las Cruces Irrigation Field Branch, Rio Grande Project,
El Paso, Texas
Power Field Branch, Rio Grande Project, El Paso, Texas
Red Bluff CVP Construction Office, Red Bluff, California
Rio Grande Project, El Paso, Texas
Shasta Field Division, Redding, California
Willows CVP Construction Office, Willows, California

In recognition of over 1,000,000 accident-free miles:

Columbia Basin Project, Ephrata, Washington
CRSP Power Operations Office, Montrose, Colorado
Missouri-Oahe Projects Office, Huron, South Dakota
Tracy Field Division, Tracy, California
Watertown Field Section, Watertown, South Dakota
Yuma Projects Office, Yuma, Arizona

In recognition of over 2,000,000 accident-free miles:

Fryingpan-Arkansas Project, Pueblo, Colorado
Missouri-Souris Projects Office, Bismarck, North Dakota

CONSTRUCTION SAFETY AWARD--1967

The Construction Safety Award is presented to contractors in recognition of exemplary safety records achieved while performing work for Reclamation. To be eligible, a contractor must have initiated and carried out an effective safety program during the term of his contract. He must have achieved a cumulative accident record lower than the average record obtained by all Bureau contractors during the preceding 3-year period. Equally important, he must have indicated a sincere interest in the safety of his employees by virtue of expending the time and effort necessary to carry out an aggressive and continuing safety effort. The following Bureau contractors earned Construction Safety Awards during 1967:

Baker-Anderson Corporation, Santa Ana, California
Blickle Company, Portland, Oregon
Brasel & Sims Construction Company, Lander, Wyoming
Bushman Construction Company, St. Joseph, Missouri
Conklin Brothers, Inc., Plainview, Texas
E. Arthur Higgins Construction Company, Salt Lake City, Utah
Granite Construction Company, Watsonville, California
Guy F. Atkinson Company, South San Francisco, California
Henry S. Rau Company, Inc., Philadelphia, Pennsylvania
Herman H. West and Company, Murphy, North Carolina
High Plains Building Company, Amarillo, Texas
Kaweah Construction Company, Visalia, California
Lester N. Johnson Company, Spokane, Washington
Lindberg Construction Company, Jamestown, North Dakota
MacGregor Triangle Company, Boise, Idaho
MSI Corporation, Rockville Centre, New York
Myers Construction Company, Redding, California
Nelson-Lydig, Inc., Spokane, Washington
Paul H. Hughes Construction Company, Pasco, Washington
Purtzer & Dutton, Reno, Nevada
R. C. Jones & Company and Shafer Brothers Construction
Company, Salt Lake City, Utah
Syblon-Reid Company, Los Banos, California
Trico Contractors, Merced, California
United Nations Constructors, Inc., Santa Monica, California
Varulco dba Leland E. Cofer, Grand Junction, Colorado



Mr. John L. Hatch, Project Construction Engineer, Bureau of Reclamation, is shown above presenting the Construction Safety Award to Mr. Dana L. Sims, President of Brasel & Sims Construction Company, and Mr. Milton R. Mamot, Foreman.
Photo PX-D-60313



Mr. M. L. DeVilbiss, Project Safety Officer, Canadian River Project, is pictured above presenting Reclamation's Construction Safety Award to Mr. Roy Hunnicut (right), President of the High Plains Building Company. Photo P662-525-7006

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

4th QUARTER, 1967

PERIOD FROM JANUARY 1, 1967 THROUGH December 31, 1967

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL *		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Washington Office	341	704,752					
Denver Office	1,402	2,860,888	1		125	0.3	44
Alaska Power Administration	42	86,208	1		10	11.6	116
REGION 1							
Boise Regional Office	185	315,829	1		5	3.2	16
Baker Project	26	62,457	1		14	16.0	224
Central Snake Project	42	76,026					
Chief Joseph Dam Project	33	70,365					
Columbia Basin Project	872	1,850,172	6		105	3.2	57
Green Springs Powerplant	2	3,255					
Hungry Horse Project	51	107,814					
Lower Columbia Development Office	44	79,067					
Mann Creek Project	7	27,398					
Minidoka Project	64	141,460					
Snake River Development Office	55	116,044					
Spokane Valley Project	11	41,753					
Third Powerplant Construction Office	140	184,042	4		197	21.7	1,070
Upper Columbia Development Office	43	83,520					
Wild Horse Dam	12	4,756					
Yakima Project	29	55,436	2		71	36.1	1,281
Totals & Averages	1,625	3,219,994	14		392	4.3	122
REGION 2							
Sacramento Regional Office	574	1,265,341					
Regional Drill Crew	40	71,559					
Albion-Eaton South Unit CVP Office	123	187,832					
Cachuma Operations Field Branch	2	4,048					
Central Coast Development Field Br.	4	9,238					
Fresno CVP Construction Office	108	212,805	1		5	4.7	24
Fresno Field Division	138	284,696					
Folsom Field Division	66	141,026					
Klamath Project Office	17	33,215					
Lahontan Basin Projects Office	63	104,186	1		30	2.6	288
Napa Development Field Branch	3	10,388					
Red Bluff CVP Construction Office	59	131,052					
San Luis Unit CVP Construction Office	340	808,576	1		18	1.2	20
Shasta Field Division	131	266,001	1		5	3.7	19
Solano Operations Field Branch	2	4,048					
Tracy Field Division	162	339,443					
Transmission Lines Office	22	52,785					
Upper North Coast Dev. Field Branch	4	7,884					
Willows CVP Construction Office	106	219,822	1		30	4.5	136
Totals & Averages	1,964	4,156,587	5		88	1.2	21
REGION 3							
Boulder City Regional Office	147	297,446	1		50	3.4	168
Boulder Canyon Project Office	142	298,508	1		45	3.3	151
Boulder City Development Office	44	87,244	1		31	11.5	355
Hoist Project Office	5	27,954					
Lower Colorado River Control Office	24	48,677					
Cibola Field Division	104	209,544	4		316	19.2	1,515
Laguna Field Division	20	37,842					
Needles Field Division	53	99,016	2		53	20.2	535
Mead Construction Office	24	41,437					
Parker-Davis Project Office	314	643,722	5	1	6,240	7.8	2,693
Phoenix Development Office	95	167,124					
Southern California Development Off.	39	75,592					
Yuma Projects Office	162	311,160	2		228	6.4	733
Totals & Averages	1,173	2,344,330	16	1	6,963	6.8	2,970
REGION 4							
Salt Lake City Regional Office	250	470,102					
Central Utah Project	201	367,299	1		18	2.7	49
CRSP Power Operations Office	291	647,042	1		100	1.5	155
Curecanti Unit	116	267,063					
Durango Projects Office	33	68,152					
Grand Junction Projects Office	62	140,536					
Logan Development Office	9	19,544					
Lyman Project	28	57,817					
SeedsKadee Project	12	38,129	1		240	26.2	6,294
Upper Green River Development Office	8	17,088					
Weber Basin Project	61	150,600					
Totals & Averages	1,071	2,243,372	3		358	1.3	160
REGION 5							
Amarillo Regional Office	108	223,794					
Albuquerque Development Office	32	60,436					
Arbuckle Project	8	21,398					
Austin Development Office	49	102,098					
Canadian River Project	46	137,925					
Lower Rio Grande Project	2	4,032					
Middle Rio Grande Project	218	437,461	6		76	13.7	174
Navajo Project	84	183,181					
Oklahoma City Development Office	20	36,586					
Pecos River Project	8	9,951					
Rio Grande Project	209	445,153	3		53	6.7	119
San Juan-Chama Project	76	162,128					
Totals & Averages	860	1,836,173	9		129	4.9	70
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

4th QUARTER, 1967

PERIOD FROM JANUARY 1, 1967... THROUGH December 31, 1967...

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
Denver Office		9,512					
REGION 1							
Baker Project	10	161,689	3		35	18.6	216
Chief Joseph Dam Project	25	41,548	2		17	48.1	409
Columbia Basin Project	210	318,585	5		68	15.9	216
Hungry Horse Project		2,245					
Mann Creek Project	6	36,922					
Minidoka Project	16	4,392					
Snake River Development Office		2,494					
Spokane Valley Project		3,102					
Third Powerplant Construction Office	233	125,054					
Wild Horse Project	12	12,846	1		21	77.8	1,635
Yakima Project	5	4,020					
Totals & Averages	517	709,672	11		141	15.5	199
REGION 2							
Auburn-Folsom South Unit CVP Office	2	1,144					
Presno CVP Construction Office	65	88,073					
Presno Field Division	2	4,458					
Klamath Project Office		3,140					
Lahontan Basin Project Office	57	139,349	1		17	7.2	122
Red Bluff CVP Construction Office	119	393,943	2		225	5.1	571
San Luis Unit CVP Constr. Office	506	1,285,019	22		561	12.7	329
Tracy Field Division	7	5,848					
Transmission Lines Office		226					
Willows CVP Construction Office	169	269,471	2		47	7.4	174
Totals & Averages	927	2,633,711	27		857	10.3	325
REGION 3							
Boulder Canyon Project Office		2,683					
Cibola Field Division	14	73,831					
Mead Construction Office	64	87,770					
Needles Field Division		5,607					
Parker-Davis Project Office	115	584,766	11		333	18.8	570
Southern California Dev. Office	15	318					
Yuma Projects Office	38	16,878	1		250	52.2	14,811
Totals & Averages	246	751,883	12		583	16.0	775
REGION 4							
Central Utah Project	153	245,793	4	1	6,027	16.2	24,520
CRSP Power Operations Office	14	49,054					
Curecanti Unit	214	964,531	9		305	9.3	316
Durango		1,468					
Grand Junction Projects Office	16	32,333					
Lyman Project	40	24,424					
Seedskadee Project		16,043					
Weber Basin Project	46	22,149					
Totals & Averages	423	1,446,695	13	1	6,332	9.0	4,377
REGION 5							
Arbuckle Project	4	10,869					
Austin Development Office		1,734					
Canadian River Project	38	117,212	4		122	34.1	1,041
Navajo Project	259	416,671	17		1,247	40.9	2,993
Pecos River Project	22	24,324					
San Juan-Chama Project	514	1,051,635	9		514	8.6	774
Totals & Averages	837	1,622,555	30		2,193	18.5	1,345
REGION 6							
Fort Peck Project		3,226					
Missouri-Oahe Projects	13	8,178					
Missouri-Souris Projects	10	11,357					
Riverton Project		88					
Upper Missouri Projects	49	148,939					
Yellowtail Project	8	41,098	1		7	24.3	176
Totals & Averages	80	212,886	1		7	4.7	33
REGION 7							
Fryingpan - Arkansas Project	539	1,774,765	44	2	12,864	27.6	7,248
Glen Elder Unit	309	953,652	12	2	12,290	12.6	12,887
Kansas River Projects	12	12,122	1		14	52.3	732
Niobrara-Lower Platte Dev. Office		10,937					
North Platte River Projects	25	72,782					
South Platte River Projects		500					
Totals & Averages	885	2,831,759	61	4	25,164	21.5	8,888
Average number of contractor employees per month during 1967: 4,800.							
CONSOLIDATED TOTALS	3,975	10,218,673	155	5	35,271	15.2	3,492
TOTALS LAST YEAR (1966)	5,168	14,476,443	194	13	98,137	13.4	6,779

*FATALITIES INCLUDED IN TOTAL DISABLING

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SAFETY

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RECLAMATION SAFETY

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First Quarter 1968

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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TABLES

Safety Performance Record

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Front Cover Photo: Mr. B. P. Bellport (left), Chief Engineer, Bureau of Reclamation, presents Bullard Hard Hat and Turtle Club Membership to Mr. Hollis Sanford (right), Chief Division of Irrigation Operations, Bureau of Reclamation, on the occasion of Mr. Sanford's retirement on February 29, 1968, at Denver, Colorado. Bureau of Reclamation Photograph PX-D-60456.

SAFETY NEWS is published quarterly by the Office of
Chief Engineer, Bureau of Reclamation,
Denver, Colorado, in the interest of
accident prevention.

TURTLE CLUB MEMBERSHIP



Mr. B. P. Bellport (left), Chief Engineer, Bureau of Reclamation, and Mr. Hollis Sanford, Chief, Division of Irrigation Operations, Bureau of Reclamation, looking at hard hat which saved Mr. Sanford from a serious or fatal injury on November 24, 1933, when he was struck on the head by a flying rock from an excavation blast during construction of Hoover Dam. (Also see front cover.)
Photo PX-D-60455

BUREAU SAFETY PERFORMANCE

1968 CUMULATIVE SAFETY RECORD
January 1 - March 31, 1968

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 2	0.0	0.0	0	0.9
Region 3	0.0	0.0	0	1.9
Region 5	0.0	0.0	0	5.3
Region 6	0.0	0.0	0	3.6
Region 7	0.0	0.0	0	7.1
Region 1	0.5	2.4	23	4.1
Region 4	<u>0.7</u>	<u>2.0</u>	<u>34</u>	<u>4.1</u>
Totals to Date	0.04	0.6	7	3.5

Totals 1967	18.0	2.7	665	3.1
-------------	------	-----	-----	-----

*Injury index is equal to frequency rate times severity rate divided by 1

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 2	0.0	0.0	0	0
Region 3	0.0	0.0	0	0
Region 4	0.0	0.0	0	0
Region 6	0.0	0.0	0	0
Region 7	0.0	0.0	0	0
Region 1	20.2	9.4	215	0
Region 5	<u>1,266.2</u>	<u>10.2</u>	<u>12,414</u>	<u>1</u>
Totals to Date	192.9	5.0	3,857	1

Totals 1967	524.7	15.2	3,452	5
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C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate	1.5
Severity rate	1
Vehicle accident rate	26.8

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1968
First Quarter

Cumulative to Date:
March 31, 1968

A. ACCIDENT CLASSIFICATION

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Falls of persons	1	2
Handling materials or equipment	<u>2</u>	<u>34</u>
Totals	3	36

B. OPERATIONAL SUMMARY

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	2, 151, 949	1	2	0. 5	1
Construction	830, 825	0	0	0. 0	0
Investigation	584, 868	0	0	0. 0	0
Power O&M	942, 913	1	17	1. 1	18
Irrigation O&M	<u>642, 534</u>	<u>1</u>	<u>17</u>	<u>1. 6</u>	<u>26</u>
Totals	5, 153, 089	3	36	0. 6	7

* * * * *

NEW ADDITION TO DENVER FILM LIBRARY

"A Study of Effective Grounding Techniques for Modern Transmission Lines," produced by the A. B. Chance Company in cooperation with the Philadelphia Electric Company, deals primarily with laboratory tests of field-type grounding procedures and equipment. The film dramatically shows the danger in using older types of equipment and improper methods.

Requests for loan of this film for project showing should be addressed to the Chief Engineer's Office, Attention 841.

* * * * *

SAFETY AWARDS

NATIONAL SAFETY COUNCIL AWARDS FOR 1967

The Bureau of Reclamation has won the National Safety Council's highest award--the Award of Honor--for the fourth time. Previous awards were received from the National Safety Council for calendar years 1963, 1964, and 1965.

For outstanding safety performance during 1967, the following Regions of the Bureau have received the National Safety Council awards indicated below:

Region 1--Boise, Idaho Award of Merit
Region 2--Sacramento, California Award of Honor
Region 4--Salt Lake City, Utah Award of Honor

COLORADO BUREAU OF MINES'

AWARD OF MERIT

Two Bureau contractors, Azotea Contractors and Oso Contractors, on the San Juan-Chama Project, Colorado-New Mexico, were awarded the Colorado Bureau of Mines' Award of Merit for outstanding effort and cooperation in the promotion of safety in the mineral industry for 1967. The Azotea Contractors (Gibbons and Reed Co., Boyles Brothers Drilling Co., and Dugan Graham Co.) are constructing the 13-mile Azotea Tunnel, and the Oso Contractors (Boyles Brothers Drilling Co.) are constructing the 5-mile Oso Tunnel.

DID YOU KNOW - -

Nine times more accidental deaths have happened at home than all our war casualties since 1776!

DEPARTMENT OF THE INTERIOR
CERTIFICATE OF SAFETY ACHIEVEMENT



The Weber Basin Job Corps Conservation Center (near Ogden, Utah) was presented the Department of the Interior Safety Achievement Award for attaining a total of 2,034,240 man-hours without a disabling injury. This no-injury record was attained during the period January 1, 1966, to August 31, 1967, and is a rare and outstanding accomplishment for members of the Center. Shown above are (left to right): Regional Safety Officer R. J. Searle presenting the award to Center Director R. A. Ulrich; C. D. Woods, Regional Job Corps Coordinator; and K. L. Powers, Regional Engineer and Regional Safety Committee member. Photo PX-D-60725



Project Manager Edward Lundberg, (left) Missouri-Souris Projects, Bismarck, North Dakota, received the Department of the Interior's Certificate of Safety Achievement from Harold E. Aldrich, Regional Director, Region 6. Mr. Jack A. McDonald, (center) Administrative Officer and Chairman of the Missouri-Souris Projects' Safety Committee, looks on. The award was presented to the Missouri-Souris Projects for having operated motor vehicles of all classes for 2,680,453 miles without an accident. This presentation represents an outstanding accomplishment and sets a new record in the Bureau of Reclamation for continuous accident-free motor vehicle operation. This record establishes a worthy goal for all motor vehicle fleets throughout the Bureau. Photo P769-600-103

COLORADO RIVER STORAGE PROJECT RECEIVES VEHICLE SAFETY AWARD

Mr. E. A. Benson, Project Power Manager for the Colorado River Storage Project, was the recipient this week of a Certificate of Safety Achievement award issued by the United States Department of the Interior for his project's outstanding record in attaining 2,046,957 vehicle miles without a reportable motor vehicle accident.

In the picture below Mr. Benson is shown presenting this award to the members of the Project Safety Committee. Left to right are: Keith Jones, Electrician, Meter and Relay Section; I. W. Roberts, Chief, Power Dispatching and Operations Branch, Robert Zwiefelhofer, Lineman, Montrose Line Unit; Herman Brown, Mechanic; James Dworak, Project Safety Officer, and Chairman, Project Safety Committee; John W. Copper, Chief, Transmission Lines and Substation Maintenance Branch; and E. A. Benson, Project Power Manager. Photo P594-427-415-NA





Employees of the South Platte River Projects Office, Loveland, Colorado, are shown above on the occasion of receiving the Department of the Interior Safety Achievement Award for working 525, 000 hours without a disabling injury. Photo PX-D-60723

* * * * *

NATIONAL SAFETY COUNCIL DATA SHEETS

The National Safety Council has recently published new or revised technical data sheets on the subjects listed below. Copies of these data sheets (by the numbers shown in parentheses) may be obtained from the National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611.

Hydrogen Sulfide (284 Revised)
Gear-Hobbing Machines (362 Revised)
Metal-Working Milling Machines (364 Revised)
Chlorates (371 Revised)
Air-Powered Hand Tools (392 Revised)
Off-the-Job Safety (601)
Inspection and Maintenance of Mechanical Power Presses (603)
Safety Nets for Construction Projects (608)
Cloth Shearing Machines (609).

* * * * *

DOMINY WRITES ON DAM SAFETY FOR JAPANESE PUBLICATION

Commissioner of Reclamation Floyd E. Dominy has authored an article on dam safety in "World Dams Today," published by The Japan Dam Association in Tokyo. Reprints of the article are available from the Department of the Interior, Bureau of Reclamation, Washington, D.C. 20240.

Entitled, "Safety of Dams--A Reclamation Action Program," the article discusses how updated meteorological, hydrological, and geological data are being applied in the study of dams and their spillways, and how operations and communications instructions for personnel at dams are being modernized for both normal and emergency conditions. As part of the safety program, under the direction of the Bureau's Office of Chief Engineer in Denver, Colorado, Reclamation field offices in the 17 Western States are compiling a "register of landslides," aimed at decreasing the possibility of destructive landslides at reservoirs.

The Bureau plans to complete by July 1971 flood studies of 58 dams built 25 years or more ago without the benefit of modern technology; and to study many smaller, non-Bureau dams upstream from Reclamation structures, to determine the degree of flood danger.

Much new technical equipment is now being employed in the present design of dams and incorporated in the structures to assure adequate safety, according to Commissioner Dominy, who states in the article: "The Bureau was the first organization in the United States to use miniature television cameras to view the walls of exploratory dam foundation drill holes and thus obtain an evaluation of the undisturbed rock."

* * * * *

DDC PAYS OFF

About a year ago Rich's Department Store in Atlanta, Georgia, put all its drivers through the National Safety Council's Defensive Driving Course. The training officer reports that the accident rate of the group has improved to the extent that he can show a direct saving over last year of \$13,230 in accident repairs alone.

* * * * *

Remarks by Howard S. Latham, Chief Safety Engineer
Bureau of Reclamation
U.S. Department of the Interior
Before Associated General Contractors of Minnesota
Minneapolis, Minnesota February 23, 1968

FUTURE OF SAFETY IN CONSTRUCTION

It is a pleasure to participate in Safety Day, and to discuss the future of safety in construction with the people who turn our plans and specifications into reality. Through your efforts, Reclamation drawings and specifications become dams, canals, powerplants, and transmission lines--all contributing to the beneficial conservation and development of America's natural resources. These achievements are made possible through the efforts of an industry staffed by men with the desire and know-how to get the job done.

Today, the industry is challenged by the problem of improving an accident record that has been consistently poor, and as such is out of character with the industry's record of accomplishment. This problem, reflected in human suffering, economic losses to the industry and to the nation, and in public criticism, must be met head-on by those responsible for the stewardship of the industry.

This is a complex, sophisticated, and changing world. Whether we like it or not, times are changing, and at a rapid rate. Yes, at a rate that is often difficult to comprehend, let alone keep up with. Progress and change is biting us on the backside, and if we don't keep moving ahead, it will swallow us.

That the basic concepts of safety and the problems confronting the construction industry are changing were never as evident as in the discussions at the AGC National Safety Conference, which was held this month in Washington, D.C. I enjoyed participating in that conference, and I believe that the panel discussions provided a prologue to the Future of Safety in Construction. Let me cite a few of the problems discussed.

There was considerable discussion of the Construction Safety Bill, which would place the administration of safety on Federally financed and interstate construction activities under the Department of Labor. There is no denying the fact that this legislative action resulted from the poor accident record in construction, coupled with the failure of some Federal agencies to consider safety an integral and important function of responsible contract administration. I believe we agree that such legislation would overturn the basic concept of effective safety, which is that safety must be considered and dealt with as a

function of management and closely integrated into all operations. It cannot be isolated and administered differently from other management considerations. Attempts to legislate safety, removing it from operations management and contract administration, have proven unsuccessful in the past. The proposed legislation would merely interfere with the efforts of State Industrial Commissions and duplicate existing Federal safety programs, proving expensive and largely ineffective. Fear of punitive action does not impress me as conducive to the promotion of safety. Safety cannot be successfully legislated or effectively enforced by a third party, particularly on the basis of hit and miss safety inspections conducted by persons not intimately familiar with the work.

The unfortunate aspect of the matter is the fact that Congress already has in its grasp the opportunity to accomplish its objective without the proposed legislation, more effectively and without costing the taxpayers another dime. Under existing legislation, Congress can, and should, require a safety clause in all bills appropriating funds for public works. Such clause would require the agencies, both Federal and State, who receive these funds, to insert safety standards in their contract specifications and to require their enforcement by the inspectors of the work. I suggest you write your Congressman.

Fortunately, there is an alternative, providing it isn't too late. Contractors must assume the ultimate responsibility and expend the necessary time and effort to improve their safety records. Labor must assume greater responsibility for providing workmen who possess the skill, training, and physical ability to perform the work efficiently and safely. Federal agencies, directing public work projects, must consider safety an integral function of responsible contract administration. Effective safety is essentially the product of honest, willing, cooperative effort, with management providing the necessary motivation and leadership.

Preplacement physical examinations were discussed. It's time the construction industry got in step with other segments of American industry, who have been enjoying the benefits of preplacement physical examinations for at least 20 years. Management and labor must undertake a realistic program designed to permit work assignments which take into account the physical fitness of the individual. It is imperative, particularly in the more hazardous occupations, such as in the operation of hoisting equipment and high speed haulage vehicles, that the employee is physically capable of performing his duties without hazard to himself or others. Other segments of industry, private utility companies, and the Government have found that such programs are beneficial to the employers, the employees, and to the community. It is time that labor and management forget their past prejudices and

recriminations, and sit down together and develop a workable and effective medical examination program for construction employees. In addition to advancing safety, such a program will improve job performance and benefit employees, in some cases adding years to their lives through early detection of disease or physical impairment.

While generally favoring a preplacement physical examination program, one labor representative, who participated in the conference, indicated that the program should be considered with the overall problem of environmental health. Considering the critical necessity for a long overdue medical or physical examination program, I don't agree that its adoption should be contingent upon consideration of an environmental health program. Realistically, provisions for safeguarding the environmental health of the worker, such as control of silicosis, dermatitis, respiratory protection, and control of atmospheric contaminants, are currently incorporated in construction safety codes and standards.

However, we certainly cannot ignore the need for further improvements in this field of safety, particularly in the operation of heavy earth-moving equipment. I'm personally convinced that air-conditioned cabs on heavy equipment operated in hot climates are desirable from the standpoint of both the operator's health as well as efficiency. Noise abatement, achieved by relocating exhaust ports or by the installation of sound barriers or absorption material, should be undertaken now. These improvements are necessary to protect the health of the operators, and are comparatively inexpensive when compared with the overall cost of the equipment. Further, dollars expended for these improvements will be returned tenfold in increased production and reduced accident costs. As an example, we have found that Reclamation's requirement for dust control devices on all percussion drills is paying off in both increased safety and greater job efficiency--this is progress in safety.

The consensus of opinion as expressed by the members on the heavy equipment panel was favorable to the installation of rollover protection on heavy earthmoving equipment. The Corps of Engineers, the Bureau of Reclamation, and the State of California require such systems. Considering the fatalities resulting from equipment rollovers, this protection is needed. Equipment manufacturers are seriously considering the possibility of equipping their rigs with rollover protection systems, and the Society of Automotive Engineers has published a minimum performance criteria for rollover protection systems on scrapers.

Adherence to modern safety concepts will necessitate the installation of emergency braking systems on high speed haulage and earthmoving vehicles. The same concept dictates the need for improvement in the design of vehicle lighting systems, overhead protection on dozers;

installation of boom stops and boom angle indicators on cranes; provision for all-round operator visibility on haulage vehicles, and the elimination of pinch points on excavation equipment. You, no doubt, can readily think of additional improvements. However, you must do more than merely think--there is a critical need for contractors and contractor associations to tell the manufacturers what safety features they want built into their equipment. The alternative is for Big Brother and the Naders to call the signals--and it probably won't be what you either need or desire.

There is another problem which must be faced, and, if possible, resolved by the contractors and the owners. This is the vexing problem of third party liability and the increasing number of tort claims being brought against the owners on the allegation that they either failed to provide a safe work environment or were negligent in the enforcement of safety standards. Some members of the legal profession publicly avow that "fear of liability" is the most effective inducement to contractor safety. This precept completely ignores the fact that personal causes contribute to far the majority of the accidents and resulting injuries. The threat of liability cannot and will not provide the safety education and training, nor cope with the problem of employee competency, which is basic to any substantial improvement in the construction safety record. I am equally convinced that legal fees and court costs, both reflected in cost of construction, are much more expensive than an enlightened safety program.

This problem must be dealt with for it affects both the responsible contractors as well as the irresponsible contractors, and the costs are borne by the entire industry. Obviously, the basic solution is an improved safety record. However, there is another possibility that may be worthy of your consideration. I believe that improved compensation insurance laws, providing realistic and adequate benefits for injured employees would materially reduce the threat of third party claims. Enlightened contractor associations and State legislatures should seriously consider this aspect of safety; a few states already have. I'm not proposing a give-away program, but a well-managed insurance program, which will insure those injured in the performance of their work the best medical attention available and an income adequate to maintain themselves and their families during recovery. Also provision should be made for rehabilitation of those unable to return to their same occupation. In short, I'm proposing that the industry take care of its own, directly and without delay and costly legal fees which benefit neither the employee nor the industry.

Here's another thought pertinent to this subject. When you discuss updating the workmen's compensation statute with the State legislature,

request that they include a clause to protect the owner as well as the employer, after all, the owner pays the bill. If compensation insurance is to be the exclusive remedy for job-connected injury or death, as the lawmakers intended, let's make it the exclusive remedy, and put an end to the increasing number of senseless and farcical claims against the owner for negligence or omissions committed by the employer.

I've reviewed only a few of the problems confronting the construction industry today, which will affect the future of safety in construction. In order to cope with these problems, management must take the leadership and assume the ultimate responsibility for safety. This essential requisite for improvement of the record was repeated over and over during the AGC National Safety Conference. Similarly, it was emphasized that safety must be integrated into all operations and management decisions. In essence, what was outlined and unanimously agreed upon was a "Do It Yourself" program, obviously with the cooperation and support of Labor, the Owner, and the Government agencies involved.

Let's consider what it takes to successfully do it yourself. I can personally assure you that it requires considerably more than simply good intentions and lip service.

If contractors managed or mismanaged other company business in the same manner as many do safety, they wouldn't be around to pick up their first monthly estimate payment. If you doubt it, as I review the basic elements of a safety program in question form, make a mental note of your organization's acceptance of these essential principles of effective safety management. Your answers will determine whether you and your organization are sincerely working at the business of safety or merely paying it lip service.

Who is directly responsible for safety in your organization? Are they individuals possessing education, experience, and ability comparable to others on the management team? In order to emphasize your company's support of safety, and to insure its effective administration, do they report directly to a top line executive?

Does your organization actually consider safety an important management function? In order to be realistic, compare the actual time spent by your job supervisors on matters of safety as compared with the time devoted to personnel matters, labor relations, cost accounting, purchasing, and other staff functions.

Consider the actual dollars expended on safety or toward the prevention of accidents. Is it proportional to the dollars spent on other management functions, or is the bulk of the safety expenditure reflected in

payment of compensation insurance premiums? Ordinarily, we find that too much is spent on cure and too little on prevention.

Do your supervisors spend as much time pouring over job safety standards as they do over the monthly cost sheets or the terms of the labor agreement. Are they as familiar with company safety requirements and the provisions of the AGC Accident Prevention Manual as they are with the contract specifications? Are the safety manuals as thumbmarked as the specifications and the labor agreements? No, I'm not attempting to be satirical, for we all avow that safety is as important as quality of product. If this is our sincere conviction, the safety manuals must be placed on the contractors' best seller list and not be permitted to accumulate dust in someone's desk drawer.

Do you demand the same degree of compliance with safety standards as you do with the standards governing the quality of the work? Are job supervisors required to be thoroughly familiar with the safety requirements, and are they expected to enforce them? For example, are carpenter foremen who fail to construct and safely maintain scaffolding subject to the same disciplinary measures as those who construct faulty formwork? In other words, do you demand uncompromising compliance with the safety requirements?

How much time does your company actually devote to safety training and education? What percent of your superintendents and foremen have completed the AGC Safety Training Course for Construction Supervisors? How else are your superintendents and foremen expected to acquire a knowledge of safety standards and safe working practices? Unfortunately, it is usually through experience, which is often costly and literally painful.

Organizations which can answer most of these questions affirmatively, and fortunately there are many, know how to conduct an effective safety program. Also, their success attests to the fact that effective accident prevention is basically good management.

It is my opinion that the greatest future need is for management to provide both motivation and safety training for its line supervisors. Top management must establish clear-cut safety policies and objectives that challenge the talents of its supervisors, at all levels. Management must generate a sincere sense of mission and breathe new life into their safety efforts. Everyone must be made to feel the persuasive sensation of pressure to perform safely and to improve the safety record.

Top management, and I mean the boss, must personally spearhead the program, not by words alone, but by actions. Subordinates and employees pay more attention to what they actually see than to what

they are told. An organization endorsing and exploiting this psychological axiom has a potent motivational tool working for it. Other equally effective tools, including proven accident prevention methods and techniques, are available to all, but only the successful organizations use them.

Equally important is the critical need for discipline in safety management. Despite the evangelistic preaching of some, there is no proof that everyone either can or desires to work safely. Experience proves otherwise and dictates the absolute necessity for establishment of specific and crystal-clear safety requirements, together with the fortitude to enforce them. An overall game plan is needed, with specific responsibilities assigned to the members of the team, and those who can't or won't follow the plan shouldn't be on the team. Without clear-cut policies and job safety requirements to point the way, and supervisors with backbone to discipline, any organization is sure to be a loser.

I've attempted to present a few of the problems which will surely affect the future of safety in construction. Also, I've briefly outlined a few basic safety concepts which should help you in coping with these problems and improving the safety record in the industry. There is one point I want to stress--Effective safety is simply good management--SAFETY MOTIVATED. The future of safety in construction will be largely determined by your desire and resolve to make construction safer, plus your willingness to expend the necessary time, money, and effort to get the job done.

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FINGERS INJURED BY FAN BLADES

A textile worker was assisting an electrical contractor to fit and connect an electrical suction fan to a finishing machine. After connecting the fan, the contractor switched it on and let it run. He then switched the power off and requested the textile worker to check the direction of the air flow. Instead of disconnecting the air hose and checking, he put his hand up behind the fan guard and caught his fingers in the fan blades, which were still revolving.

An unsafe act was committed by the worker in putting his hand behind the guard -- also an effective guard would have prevented access to the danger area.

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FROM THE FIELD

REGION 4 HOLDS SAFETY CONFERENCE
AT MONTROSE, COLORADO



The above photograph was taken during Region 4's 13th Safety Conference held at Montrose, Colorado, on Tuesday, March 26, 1968. The conference theme, "Management Safety Responsibilities," was effectively presented by experienced speakers representing contractors, organized labor and the Government. Photo P594-427-396-NA

Region 2, Sacramento, California: Robert W. Cary, Regional Safety Officer, and his assistant, Larry Thomas, attended the California Safety Congress on March 6 and 7 at the Jack Tar Hotel in San Francisco.

The Annual Awards Dinner of the Sacramento Safety Council was held March 18, 1968, with more than 350 persons in attendance. During the awards ceremony, three presentations of awards earned by Region 2 in calendar year 1967 were made to Mr. H. E. Horton, Acting Regional Director, as follows:

First Place Winner in the Commercial Vehicle Safety Contest for the State and Federal Government Division

First Place Winner in the Construction Classification of the Industrial Safety Contest

And Region 2 was the only winner in the Sacramento area of the National Safety Council's highly coveted Award of Honor, which presentation was made by Mr. J. O. Burpo, Contest Chairman and Member of the Board of Directors of the National Safety Council.

Middle Rio Grande Project, Albuquerque, New Mexico--New Safety Signs: In an effort to maintain safety awareness among employees and stimulate their interest, the Middle Rio Grande Project has painted large signs throughout the Project worded "Work Safely." Pictured below is a view looking at the south side of the Albuquerque Branch headquarters office. Photo PX-D-60722



Region 1, Boise, Idaho--Safety Training: Many phases of safety training are being conducted throughout Region 1, including the completing of Electrical Safety Training by 44 employees of the Third Powerplant Construction Office at Coulee, Washington. At the Columbia Basin Project, Ephrata, Washington, 38 employees recently completed training in Defensive Driving and 14 employees completed Power Field Division Fire Training.

Region 7 Regional Office, Denver, Colorado--First Aid Class: Shown below is the recent first aid class of the Region 7 Regional Office given for Bureau of Mines First Aid Instructors and the Scuba Diving Team, taught by Mr. George Fritts from the U.S. Bureau of Mines. Left to right: Jerry C. Moore, William Watkins, Darrell Temple, George Fritts, N. B. Bennett III, William A. Thompson, and Woodrow J. Hayes. Photo PX-700-2607NA



Region 3, Boulder City, Nevada--First Aid Training:



Paying close attention to "Resusci-Anne" training manikin used in teaching mouth-to-mouth resuscitation are these Bureau of Reclamation employees who recently completed the Bureau of Mines first aid course. Seated from left to right are: O. L. McCracken, James S. Beneda, Harold W. Beery, Dean A. Ellsworth, and Albert M. Peele--all of the Mead Construction Office. Standing, left to right, are: Vernon M. Arasmith, Fred R. Heinle, Vernon L. Yerton, Mead Construction Office, and Melvin M. Currier, Guide, Hoover Dam, Boulder Canyon Project. The class was conducted by Mrs. Mildred Rhoades of the Regional Safety Office, standing. Photo PX-D-60724

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WATER SAFETY

WATER SAFETY -- PROMOTION NEEDED!

The National Safety Council reported 4,400 nontransport drownings in 1965. Newspaper stories told of 226 swimming and wading pool drownings and 86 from underwater diving. Persons also drowned from falling into the water from docks, bridges, shores, while fishing, or in recreational boating.

The U.S. Coast Guard annual report of "Boating Statistics 1966" (CG-357) presents various analyses of reported boating accidents which resulted in loss of life, personal injury incapacitating any person for more than 72 hours, or property damage in excess of \$100. The 4,350 boating accidents involving 5,567 vessels resulted in 1,318 fatalities, 1,555 injuries, and \$7,334,500 in damages.

In total, this seems to be a dear price to pay for recreation. As this is strictly an off-the-job activity, there is little control or opportunity for group or mass education on the subject of water safety.

The U.S. Coast Guard, National Safety Council, insurance companies, and various publishing concerns have produced booklets, brochures, pamphlets, and posters describing and illustrating recreational hazards in boating, fishing, and swimming.

Government agencies (through their safety committees and recreation associations), field Federal Safety Councils, industrial establishments, and unions could perform a much needed service by promoting annual campaigns on water safety. Using the many materials available, water safety information could be provided to employees and their families. Posters, flyers, and booklets would help to bring this matter to their attention. Arrangements for first aid training--at least artificial respiration--would make people conscious of the need for caution, as well as giving them knowledge of emergency measures.

Recreation on and in the water can be fun and healthful--if it can be done safely--but, this disorganized sport needs organized education. What are you doing about it?

Rio Grande Project--El Paso, Texas. An intensive safety campaign to keep children from harm in irrigation canals and drains has been launched by the Bureau of Reclamation's Rio Grande Project.

The campaign even has a star--a cartoon character called "Safety Sam," created by Mrs. Josefina Derryberry, a cartographic technician with the project.

Safety Sam provides the theme for a program aimed at educating children and parents to the hazards of swimming in, or playing near, the project's drainage canals and ditches. They hope to enlist the aid of the schools in getting Safety Sam's message across--that it's hazardous for youngsters to make the ditches and canals a play area.

Bureau records show that 47 persons have been drowned in irrigation and drainage systems of the Rio Grande Project during the past 10 years. Ten of these were children five years of age or less; and 22 were over 21. So the hazard is not restricted to children alone.

The project's irrigation system--one of the nation's largest--consists of 600 miles of canals and laterals in the distribution system, with waterflow capacities ranging from 20 cubic feet per second to 900 cubic feet per second. There are also 465 miles of drainage ditches. Their irrigable area extends along the Rio Grande from Caballo Dam in New Mexico to the El Paso-Hudspeth County line in Texas, a distance of 155 miles.

Region 2--Sacramento, California. Region 2's Water Safety Conference was held April 17, 1968, at the Sacramento Inn. The theme of the conference was "Today's Problem--Reservoir Accidents." Mr. John Fleming, Manager of the Public Safety Department of the National Safety Council, Chicago, was the keynote speaker.

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15 ASPHYXIATED IN HYDRO TUNNEL -- Cloud of fine dust blamed

Fifteen men died of asphyxiation at the face of the main tunnel of Peru's Mantaro River hydroelectric project recently, after a routine dynamite blast. One of eight survivors of the tunneling crew said that immediately after the blast, a dense, cloudlike substance gushed from the roof and face of the tunnel, enveloping them. None of the men carried masks and the ventilation pipe ended 100 yards back from the tunnel face. The survivors ran the 1,000 yards to the tunnel exit. Those who died jumped on a muck drain and lost vital seconds as the train operator tried unsuccessfully to start the engine. The contractor for the \$180-million project says gas tests carried out twice each shift showed no gas. A test had been made only shortly before the accident. Autopsies that were performed on the victims disclosed death by asphyxiation--not gas poisoning. A popular theory is that the dynamite blast opened a pocket of extremely fine dust.

VEHICLE SAFETY

GM OFFERS NEW SAFETY FILM

General Motors has produced a new motion picture to encourage motorists to protect themselves with the lap and shoulder belts which are now standard equipment on passenger cars sold in the United States.

The film is titled "UFO," for "Unrestrained Flying Objects." It stars a family of four test dummies who emphasize the protection the belts can provide in the event of collision and also demonstrate the proper way to use them.

This full-color, 14-minute film--16 millimeter sound--was developed as part of General Motors continuing campaign to encourage the use of passenger restraints. It will be made available to GM employees, schools, driver education classes, television stations and other groups.

Other safe driving films from General Motors include, "We Drivers," "Destination Safety" and "Safety First-Second-Third."

For loan of these films, write to the General Motors Film Library, General Motors Building, Detroit, Michigan 48202.

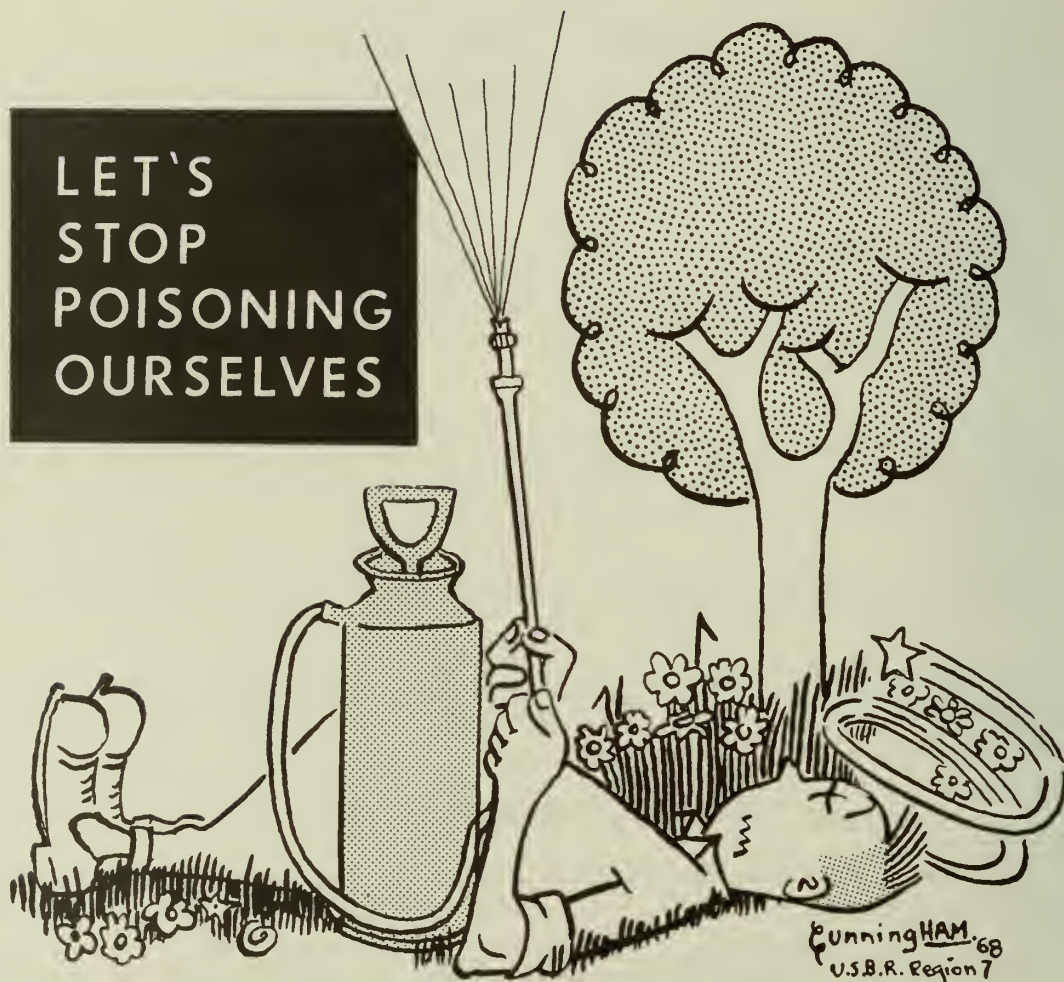
THE CASE FOR SEAT BELTS

A recent issue of the United States Attorneys Bulletin, published by the Department of Justice, contained the following item:

In a recent Federal Tort Claims Act case, the District Court for the Southern District of Mississippi reduced a damage award in a motor vehicle collision case, from \$150,000 to \$75,000 based upon the Court's finding that the plaintiff's failure to have fastened an available seat belt was negligence and a 50 percent contributing cause of the injuries sustained. Kelly v. United States, Civil No. 4094 (S.D. Miss.). Though the decision represents an application of the comparative negligence law of Mississippi, there may be a growing disposition on the part of the courts generally to treat the failure to utilize seat belts as contributory negligence or as a basis for reducing a damage award where the failure is causally related to the injuries complained of. (See, 1 University of San Francisco Law Review 277.)

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OFF-THE-JOB SAFETY



On the front display label of a famous-brand insect killer this legend appears in boldface capitals: **NON-TOXIC TO HUMANS AND PETS.**

On the reverse side of the can in much smaller type it says, "CAUTION: Keep out of reach of children. Do not spray directly on food, dishes or kitchen utensils. Can be used around food products, provided they are protected from direct contact. Remove or cover fish aquaria in areas to be treated."

Is somebody lying? Not necessarily, but there is an important point to be made regarding pesticides of all sorts: they contain poisons--poisons that under certain circumstances and in sufficient amounts can affect humans in much the same way they harm insects.

Great effort has been expended to develop poisons that will kill bugs quickly but be as harmless to people as possible. To further protect the public, the labeling and interstate sale of these pesticides are under the strict supervision of the federal government.

But pesticide accidents happen only too frequently. A 12-year-old Tennessee boy poured a whitish liquid into a baby bottle and gave it to his year-old sister. Shortly afterwards, the baby was pronounced dead at a nearby hospital. What the boy thought was milk was actually a potent roach killer.

A 65-year-old California man reached into a bathroom cabinet for some medicine and grasped a bottle of lethal poison instead. He took a large gulp of the syrupy liquid before realizing his mistake. He rushed gasping to his doctor's office, from which a fire department ambulance took him to a hospital for emergency treatment. It was a close call.

Almost the entire population of Argyle, Minnesota, had to be evacuated last summer after deadly parathion, an agricultural pesticide, had mistakenly been used by a spray plane instead of a milder pesticide intended for mosquito control. Except for a few cases of nausea, serious effects were averted by quick action of town officials.

Restrictions on DDT

For years the Food and Drug Administration has stipulated that DDT not be used in or around dairy barns or on forage crops intended for dairy animals. Just this year the federal government established rigid tolerances for residues of DDT in milk and milk products. Now, no more than 5 one-hundredths of a part of DDT per 1 million parts of whole milk will be permitted.

These precautions are necessary because of a special characteristic of DDT (shared, incidentally, by numerous other pesticides, many of them even more toxic): they accumulate in the fatty tissues of the body. Absorbed in small amounts from time to time in foods and by skin exposure, they can build up in the system faster than the body can eliminate them. Eventually, if the intake is continued at a high enough level, the exposed person may fall "mysteriously" sick. Such an illness can be extremely difficult to diagnose and valuable time can be lost in finding the right treatment.

DDT has found its way into the bodies of almost all Americans, most of it being so-called "dietary DDT," according to the U.S. Public Health Service. We have eaten the chemical because it was sprayed or dusted on the food we ate or on the food of the animals that provide our meat and milk. The DDT remains stored in the fatty tissues of

our bodies and it is augmented almost every time we eat a meal. If intake were completely discontinued, says PHS, our bodily content of DDT would be eliminated--but only very gradually.

Since it's next to impossible to avoid intake of small regular amounts of DDT and other pesticide chemicals, great care should be taken to avoid additional exposure. Professional crop dusters and agricultural workers who deal with poisons in their work often go to great lengths to avoid contact with dangerous chemicals. Many of them dress in man-from-Mars outfits and operate their equipment with painstaking care.

Guides for Gardeners

For the average homeowner with a small garden these elaborate precautions are not usually necessary. But several common-sense safety practices are in order for all handymen and gardeners who find it necessary to use pesticides in and around the house.

First, never buy and use any pesticide without reading the label carefully and completely. Be sure you're getting the right mixture for your needs and that you have the right equipment to apply it. Take special note of any "CAUTION" labeling.

Follow the label's mixing directions exactly. If you intend to spray trees or overhead vines, stay upwind and cover yourself with a waterproof garment such as a raincoat or plastic poncho and wear goggles. In all cases, cover your head with a brimmed hat or heavy material. Don't plan to spray or dust if there's a strong breeze that might carry the chemical beyond the immediate area.

Keep children and pets away from the areas where you mix and apply the pesticide. Following application, keep people away from the area and see that they avoid contact with sprayed surfaces.

Before spraying garden crops, double check the label for restrictions on spraying the plants that will be eaten in future weeks. Depending on the pesticides used and when applied, most leafy vegetables and fruits such as tomatoes must not be sprayed during a certain period of time before harvest. And of course all vegetables should be washed before they are eaten. Neglecting these precautions might place dangerous poison right on your dinner table.

Remember that correct storage of pesticides can be a life-or-death matter. Keep poison products in their original containers--never in pop bottles, fruit jars or any unmarked can, box or bottle where they might be mistaken for food or drink.

Keep pesticides together in a special cabinet. If you or your neighbors have young children, keep the cabinet under lock and key at all times--it's the only safe way.

Finally, dispose of empty containers immediately. Wash them out if possible. If you must burn them, remember not to subject yourself or a neighbor to the smoke or fumes because gases released by the heat may be poisonous. Above all never throw boxes, bottles or cans containing leftover amounts in trash cans or dumps accessible to children.

Keep in mind that a poison stored improperly in your house or garage is like a loaded gun that's ready to go off--into the eyes or stomach of any child or any adult who might mishandle it due to carelessness, ignorance or the mistakes of age. Guard your household against a pesticide poisoning.

This list includes the names of the common poisons you are likely to encounter on the labels of the pesticides you purchase. The compounds are listed according to their toxicity, their ability to poison you if misused. Many brands are mixtures of several compounds.

SUPER TOXIC	VERY TOXIC	MODERATELY TOXIC
HEPT	Lethane	Thanite
TEPP	Toxaphene	Metoxychlor
Phosdrin	Rotenone	Allethrin
Parathion	Malathion	Kerosene
White Arsenic	DDT	Pyrethrins
	TDE	
	DDD	
EXTREMELY TOXIC		SLIGHTLY TOXIC
Demeton (Systox)	Chlordane	Captan
Aldrin	Lindane	Cryolite
Dieldrin	Benzene Hexa- chloride (BHC)	Phaltan
Paris Green	2, 4-D	Piperonyl Butoxide
Lead Arsenate	Xylene	Pyrenone
Endrin	Heptachlor	
Thallium	Warfarin	
Mercury (organic compounds)		

How To Belt The Little Ones

“INFANTS and small children have been almost totally neglected in the national effort to reduce injuries and death on our highways.”

That statement comes from the Physicians for Automotive Safety and the concern of these doctors is shared by many mothers who have written the National Safety Council for advice on the best way to safeguard infants and toddlers in the family auto.

For adults the best form of restraint in an auto is easy to prescribe—the lap belt or, if available, the combination lap and shoulder belt. Unfortunately, there is no simple answer to how to belt in very small children.

The standard lap belt is not recommended for toddlers and young children below three or four years because they are not scaled-down adults. A child's legs are relatively short, his pelvic bones are not well developed and his center of gravity is high. For these reasons he is easily pulled up and out of a standard safety belt by the forces of an accident, possibly suffering more severe injuries than if he were not belted at all.

Then how do you restrain small children until they are big enough to fit into car safety belts? Unfortunately, there is no simple solution, but manufacturers are at work on the problem. New restraining devices are appearing on the market that are improvements over much of the improperly designed and often shoddy equipment now available, such as the flimsy and useless seat with play steering wheel so often seen.

General Guidelines

It is not practical to recommend any universal device that would be suitable for every situation, but

there are some general guidelines that may help parents provide added safety for their youngsters.

- If possible, do not put young children in the front seat. The back seat is safer, no matter what restraining method is used.
- Avoid using lap belts on very small children. They cannot tolerate high crash forces and these belts cannot be fitted around them for safe use.
- Do choose devices with sturdy webbing and anchorages meeting safety standards.
- Place high priority on acceptability. If the device results in a feeling of confinement or restriction, the child will reject it and it will not be used.
- Finally, remember that the device should not be a sometime thing. To be effective it must be routinely used.

Infants

Until an infant reaches about eight months and can hold his head up, the best way for him to travel is in a well-padded bassinet or car bed. Holding an infant in your arms is not really safe. Above all, do not secure the child in the same strap you are wearing at the same time.

The best place for a bassinet or car bed is in the rear of the car—on the floor if space permits. Otherwise place the bassinet on the rear seat parallel to length of car. If possible the bassinet should be secured front and rear by available lap belts. (An unused front belt is pulled through the space between seat and seat back, twisted several times around legs of car bed and buckled.)

Use the metal hangers that come with the bassinet to fasten it over front and rear seat backs. If this is not possible in your car, be sure to secure any loose hangers.

Sides of the bassinet should be firm, noncollapsible, and well-padded. There should be no sharp or rough edges. A strong net covering or harness attached to the bassinet to prevent infant ejection is desirable.

Toddlers

As soon as a child can control his head and back, safety harness vests and child safety seats offer the best protection. In general, they are recommended for children from one to six years old, or until their weight exceeds 50 pounds.

Harnesses

A harness may seem more complicated than a special safety seat but it is less expensive, often allows fuller movement, and it is usually not difficult to put on. Harnesses should be strapped around the child's chest and pelvic regions, rather than the waist and fleshy portions of the body. Avoid harnesses that do not provide positive protection for the child's torso. Do not choose one that allows the child to slip out of it easily.

A quick-release clasp should be easily accessible to an adult, but the toddler should not be able to open the buckle. (As the child grows older, he should be trained to open a safety buckle quickly and easily.)

Harnesses should be anchored to the car structure—not just the seat back.

Here are three of the better safety harnesses now on the market.

The *Safe-Hi* child belt, made by Rose Mfg. Co., anchors to the floor. The harness portion straps over the seat back and connects with sliding ring to chest, lap and crotch straps on the child.

The *Irvin Child's Auto Safety Harness* features a verticle over-the-seat restraining strap, a zipper-front

harness vest, shoulder strap, hip band and leg strap. The restraining strap fits into a floor bracket and the belt is slipped through the harness waist band loop, then clipped into buckle at top of seat back. When the restraining strap is tightened so that the child is held snug against the seat, he can still sit, stand or lie down. Fits children up to six years.

The *Child Auto Safety Vest*, made by American Safety Equipment Corp., is designed for children of 20 to 50 pounds capable of sitting upright by themselves. The vest combines shoulder straps, mesh and lap belt, lower and upper back straps, and there is also a pair of "tail straps" that attach the vest portion to the floor. Although a rear seat installation is desirable, a seat back retainer (sold separately) is recommended when the child is seated in any front seat having a hinged back or in the second or third seat of a station wagon.

Safety Seats

Flimsy, rigid-frame child seats, and those that hook over the back of a car seat are a common sight in family autos. Some of these might help in a sudden stop but they are useless — perhaps even dangerous — in an accident. Fortunately, major car makers are turning their attention to the scientific design of improved restraints that take into account the body build of very small children.

When using any type of child seat, it is important to always anchor the structure with the standard auto safety belt. And if possible the child seat should be placed in the rear seat. (On two-door cars with folding front seats, it is always best to place the child seat in the rear of the car.)

Usually at about the age of three a child can begin using standard safety belts. First it may be well to provide him with a firm cushion to give improved visibility. Make sure cushion slack is taken up. □



ASE safety vest fits comfortably over little girls' dress.



A radical design is the Ford Motor Company *Tot Guard*. This three-piece bolster or shield can be held in place rigidly by a lap belt. The upper removable surface is padded and provides a play area for the child. Small toddlers can sleep comfortably while still restrained. Even though a child is free to move about within the tunnel of the bolster, it is difficult to wriggle out or accidentally release the lap belt. The *Tot Guard* is designed to accommodate children from one to six years of age having seating heights between 19 and 25 inches. A three-inch molded plastic seat is an integral part of the unit and must be used.



The *General Motors Child Safety Seat* is a rigid plastic device. The seat is contour padded and has a padded vinyl armrest that folds back for quick release. The safety seat is secured by a heavy plastic lip that anchors into the seat cushion fold, below the steel seat rim. Although the seat has an integral chest strap, the existing vehicle lap belt must be used to restrain the child. The seat is designed for use by children up to 30 pounds. The manufacturers state that the seat should be used only on GM passenger vehicles equipped with safety belts and on seats that do not fold, or on folding seats equipped with a latch to hold the seat back upright.

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

1st QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH March 31, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR FATAL #			
Washington Office	339	171,528					
Denver Office	1,382	699,120					
REGION 1							
Boise Regional Office	186	73,461	1		2	13.6	27
Baker Project	17	7,455					
Central Snake Project	42	19,536					
Chief Joseph Dam Project	34	15,954					
Columbia Basin Project	929	470,800	1		17	2.1	36
Green Springs Powerplant	2	1,114					
Hungry Horse Project	50	26,386					
Lower Columbia Development Office	47	19,861					
Mann Creek Project	3	1,660					
Minidoka Project	64	33,615					
SNAKE RIVER DEVELOPMENT OFFICE	59	30,406					
Spokane Valley Project	2	2,584					
Third Powerplant Construction Off.	166	76,108					
Upper Columbia Development Office	48	20,808					
Wild Horse Dam	15	5,628					
Yakima Project	29	12,882					
Totals & Averages	1,693	818,248	2		19	2.4	23
REGION 2							
Sacramento Regional Office	576	315,898					
Regional Drill Crews	38	21,454					
Auburn-Folsom South Unit CVP Office	151	69,101					
Cachuma Operations Field Branch	2	1,008					
Central Coast Dev. Field Branch	4	1,920					
Folsom Field Division	64	33,855					
Fresno CVP Construction Office	116	18,774					
Fresno Field Division	143	70,728					
Klamath Project Office	21	9,595					
Lahontan Basin Projects Office	61	31,096					
Napa Development Field Branch	3	1,512					
Red Bluff CVP Construction Office	46	25,760					
San Luis Unit CVP Construction Off.	286	156,200					
Shasta Field Division	134	68,584					
Solano Operations Field Branch	2	1,008					
Tracy Field Division	157	81,795					
Transmission Lines Office (Reno)	20	10,553					
Upper North Coast Dev. Field Branch	4	2,023					
Willows CVP Construction Office	103	52,584					
Totals & Averages	1,929	1,003,468					
REGION 3							
Boulder City Regional Office	172	82,240					
Boulder Canyon Project Office	143	74,830					
Dixie Project Office	5	2,600					
Mead Construction Office	26	12,456					
Lower Colorado River Project Off.	191	90,326					
Parker-Davis Project Office	314	201,237					
Phoenix Development Office	96	46,080					
Southern California Dev. Office	37	18,240					
Southern Nevada Water Project	37	19,160					
Yuma Projects Office	161	77,600					
Totals & Averages	1,182	624,769					
REGION 4							
Salt Lake City Regional Office	242	105,543					
Central Utah Project	199	96,525					
CRSP Power Operations Office	295	148,680					
Curcanti Unit	101	46,768					
Durango Projects Office	33	17,941					
Grand Junction Projects Office	53	29,168					
Logan Development Office	9	4,680					
Lyman Project	25	12,240					
Upper Green River Dev. Office	18	7,460					
Weber Basin Project	60	31,384	1		17	31.9	552
Totals & Averages	1,035	500,389	1		17	2.0	34
REGION 5							
Amarillo Regional Office	107	51,350					
Albuquerque Development Office	32	17,903					
Arbuckle Project	3	2,280					
Austin Development Office	48	24,960					
Canadian River Project	36	19,413					
Lower Rio Grande Project	2	1,008					
Middle Rio Grande Project	218	103,657					
Navajo Project	83	44,189					
Oklahoma City Development Office	21	9,102					
Pecos River Office	7	3,334					
Rio Grande Project	215	105,369					
San Juan-Chama Project	77	40,389					
Totals & Averages	849	422,954					
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

1st QUARTER, 1968.

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT
GOVERNMENT FORCES

PERIOD FROM JANUARY 1, 1968-- THROUGH-- March 31 , 19 68

PERIOD FROM JANUARY 1, 1968 - THROUGH March 31, 1968							
REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL*	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	164	78,720					
Geology and Drill Crews	18	8,474					
Canyon Ferry Project	19	8,420					
Fort Peck Project	38	16,422					
Missouri-Guine Projects	170	89,280					
Missouri-Souris Projects	196	92,435					
Power System Operations Office	45	21,440					
Riverton Project	5	2,498					
Yellowtail Construction Office	32	15,734					
Yellowtail Project Office	31	16,005					
Upper Missouri Projects	92	43,044					
Totals & Averages	818	382,472					
REGION 7							
Denver Regional Office	220	112,030					
Fryingpan-Arkansas Project	235	120,632					
Glen Elder Unit	84	41,160					
Kansas River Projects	83	43,344					
Mohrara-Lower Platte Dev. Office	33	16,808					
North Platte River Projects	239	115,273					
South Platte River Projects	161	80,844					
Totals & Averages	1,055	530,141					
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (1967)	10,302	5,153,089	3		36	0.6	7
*FATALITIES INCLUDED IN TOTAL DISABLING	10,395	21,341,433	57	2	14,182	2.7	665
JOB CORPS CONSERVATION CENTERS							
Columbia Basin Job Corps Center							
Staff	51	30,676					
Enrollees	196	271,104	1		1	3.7	4
Marsing Job Corps Center							
Staff	48	34,944					
Enrollees	153	226,864					
Leviston Center (Deactivated)							
Staff (including VISTA)	10	42,704					
Enrollees	0	107,408					
Toyon Job Corps Center							
Staff (including 1 VISTA)	47	66,016					
Enrollees	157	190,800					
Collibran Job Corps Center							
Staff (including 1 VISTA)	35	18,164					
Enrollees	92	134,176					
Weber Basin Job Corps Center							
Staff (including 2 VISTA)	57	30,504					
Enrollees	243	306,608					
Arbuckle Job Corps Center							
Staff	36	45,532					
Enrollees	116	151,232	1		1	6.6	7
Casper Job Corps Center							
Staff	51	69,888					
Enrollees	190	250,244	1		1	14.3	14
McCook Center (Deactivated)							
Staff		59,520					
TOTAL STAFF	331	389,900	1		1	2.6	3
TOTAL VISTA	4	8,048					
TOTAL ENROLLEES	1,147	1,633,436	2		2	1.2	1
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (1967)	1,482	2,036,384	3		3	1.5	1
*FATALITIES INCLUDED IN TOTAL DISABLING	1,679	9,958,392	23		12,487	2.3	1,254

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

1st QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH March 31, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 1							
Baker Project	15	4,979					
Chief Joseph Dam Project	14	4,751					
Columbia Basin Project	307	97,658	2		64	20.1	642
Green Springs Powerplant	2	34					
Mann Creek Project	5	271					
Minidoka Project	44	12,116	1		5	40.5	413
Snake River Development Office	6	2,040					
Spokane Valley Project		266					
Third Powerplant Construction Off.	402	141,264					
Wild Horse Dam	11	4,505					
Yakima Project	23	10,031					
Totals & Averages	834	320,675	3		69	9.4	215
REGION 2							
Auburn-Folsom South Unit	51	14,448					
Fresno CVP Construction Office	99	17,263					
Fresno Field Division	4	118					
Lahontan Basin Projects Office	61	7,128					
Red Bluff CVP Construction Office	53	30,664					
San Luis Unit CVP Construction Off.	166	70,278					
Tracy Field Division	2	176					
Willows CVP Construction Office	92	40,582					
Totals & Averages	528	200,657					
REGION 3							
Lower Colorado River Project Office	74	20,279					
Mead Construction Office	71	30,038					
Parker-Davis Project Office	19	16,304					
Southern California Dev. Office		2,934					
Yuma Projects Office	50	15,058					
Totals & Averages	214	93,803					
REGION 4							
Central Utah Project	88	35,274					
CEPP Power Operations Office	4	640					
Circumferential Unit	22	56,737					
Durango		2,000					
Grand Junction Projects Office		300					
Weber Basin Project	17	6,233					
Totals & Averages	201	101,884					
REGION 5							
Arbuckle Project	10	2,294					
Canadian River Project	17	8,404					
Navajo Project	311	151,698	3		74	19.4	488
Pecos River Office	11	6,804					
Rio Grande Project	6	829					
San Juan-Chama Project	530	319,675	2	1	6,010	6.3	15,500
Totals & Averages	897	490,098	5	1	6,084	10.2	12,414
REGION 6							
Missouri-Oahe Projects	6	1,663					
Missouri-Jouris Projects	0	2,426					
Riverton Project	17	1,916					
Upper Missouri Projects	40	22,733					
Yellowtail Construction Office	81	26,725					
Totals & Averages	193	55,468					
REGION 7							
Fryman-Arkansas Project	419	232,427					
Glen Elder Unit	173	77,617					
Kansas River Projects	19	4,313					
North Platte River Projects	16	10,480					
South Platte River Projects		430					
Totals & Averages	627	332,267					
CONSOLIDATED TOTALS							
	3,488	1,595,416	4	1	6,153	5.0	3,357
TOTALS LAST YEAR (1967)	3,775	10,219,673	155	5	35,271	15.2	3,452

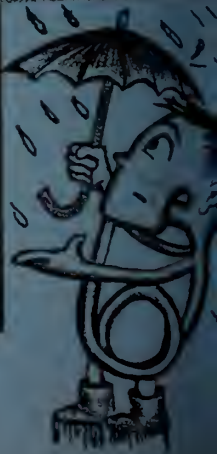
*FATALITIES INCLUDED IN TOTAL DISABLING

GPO 842-861



**STAY OUT OF WATER
IF IT IS STORMY !**

DEPARTMENT OF THE INTERIOR—BUREAU OF RECLAMATION



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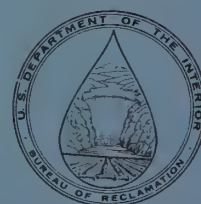
RECLAMATION SAFETY NEWS



Second Quarter 1968



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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TABLES

Safety Performance Record

Government--First 6 months 1968	27-28
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Front Cover Photo: Reclamation Commissioner Floyd E. Dominy presenting the Bureau's Construction Safety Award to Mr. Harold Gourlie, Vice President, Morrison-Knudsen Company, for the exemplary safety record achieved by Morrison-Knudsen, Utah - Brown & Root during construction of San Luis Dam and Pumping-Generating Plant in California. The contractors in this joint venture worked from January 8, 1963, to August 4, 1967--a total of 6,361,456 man-hours--and achieved a frequency rate of 7.4 (accidents per million man-hours worked) and a severity rate of 3,967. Mr. Gourlie was the Project Manager for the contractors on this job under Specifications No. DC-5855. Bureau of Reclamation Photo PX-D-61601.

SAFETY NEWS is published quarterly by the Office of
Chief Engineer, Bureau of Reclamation,
Denver, Colorado, in the interest of
accident prevention.

BUREAU SAFETY PERFORMANCE

1968 CUMULATIVE SAFETY RECORD
January 1 - June 30, 1968

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 5	0.0	0.0	0	3.4
Region 6	0.1	1.2	7	1.9
Region 7	0.1	1.0	11	4.0
Region 4	0.2	1.0	17	1.6
Region 2	0.5	1.0	51	1.1
Region 1	1.8	1.8	99	2.3
Region 3	<u>2.3</u>	<u>1.6</u>	<u>142</u>	<u>3.6</u>
Totals to Date	0.5	1.1	47	2.5
<hr/>				
Totals 1967	18.0	2.7	665	3.1

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 6	6.3	5.5	114	0
Region 2	7.2	4.4	163	0
Region 3	11.6	4.6	276	0
Region 7	25.7	15.3	168	0
Region 4	80.1	17.6	455	0
Region 1	118.4	14.4	822	0
Region 5	<u>872.7</u>	<u>13.0</u>	<u>6,713</u>	<u>1</u>
Totals to Date	245.5	12.1	2,029	1
<hr/>				
Totals 1967	524.7	15.2	3,452	5

C. RECLAMATION CIVILIAN CONSERVATION CENTERS

Frequency rate	2.5
Severity rate	4,540
Vehicle accident rate	17.8

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1968
Second Quarter

Cumulative to Date:
June 30, 1968

A. ACCIDENT CLASSIFICATION

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Vehicles	1	90
Falls of persons	3	114
Handling materials or equipment	<u>7</u>	<u>284</u>
Totals	11	488

B. OPERATIONAL SUMMARY

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	4, 323, 230	2	14	0.5	3
Construction	1, 662, 554	5	329	3.0	198
Investigation	1, 195, 628	1	100	0.8	84
Power O&M	1, 905, 778	1	17	0.5	9
Irrigation O&M	<u>1, 331, 720</u>	<u>2</u>	<u>28</u>	<u>1.5</u>	<u>21</u>
Totals	10, 418, 910		488	1.1	47

* * * * *

BUREAU CONSTRUCTION SAFETY STANDARDS REVISED

Reclamation has published a new construction safety manual, entitled "Construction Safety Standards, First Edition." The new manual supersedes "Safety Requirements for Construction by Contract, Third Edition," and is applicable to all future construction contracts as well as to all work performed by Bureau personnel.

Included in the new manual is provision for equipping off-highway, earthmoving equipment with rollover protection and emergency braking systems. These and other revisions were considered essential in order to keep pace with the changes taking place in the industry and to further improve the construction safety record.

Copies of the new manual may be obtained from the Office of Chief Engineer, attention Code 841, Department of the Interior, Bureau of Reclamation, Building 67, Denver Federal Center, Denver, Colorado 80225.

* * * * *

SAFETY AWARDS

CONSTRUCTION SAFETY AWARD



Presentation of the Construction Safety Award to Eagle Construction Corporation was made in Denver, Colorado, by Mr. B. P. Bellport, Chief Engineer, Bureau of Reclamation. The award was issued for an exemplary accident prevention record during construction of the Blue Mesa Powerplant and Switchyard, Curecanti Unit, Colorado River Storage Project, and represents 180,624 man-hours for completion of work under contract, Specifications No. DC-6342, without a single disabling injury. Shown in above photo (left to right) are: B. P. Bellport, USBR; Harold Kester, Eagle Construction Corporation; James D. Seery, USBR; and James Decker, Eagle Construction Corporation. Photo PX-D-6159.

DEPARTMENT OF THE INTERIOR
CERTIFICATE OF SAFETY ACHIEVEMENT

The Watertown, South Dakota, crew of the Power Division, Missouri-Oahe Projects, has received the Department of the Interior's Certificate of Safety Achievement for their remarkable record in safe driving. They have operated 6 to 9 motor vehicles, from sedan deliveries to FWD line trucks, under some of the most hazardous and trying driving conditions imaginable well over one million miles from May 28, 1958, to the present time without an accident.



Project Manager Martin H. Oleson, Jr., presents the Department of the Interior Certificate of Safety Achievement to the Watertown Field Section, Operation and Maintenance Branch, Power Division of the Missouri-Oahe Projects Office, Huron, South Dakota. Pictured above, standing, left to right: E. W. Smith, Chief, Power Division; Virgil Kremer, Groundman; Floyd Tubandt, Electrician; Victor Laue, Truck Driver; Warren Johnson, Lineman; Charles Pennell, Lineman; Robert Madsen, Electronic Equipment Mechanic; Newton Staley, Projects Safety Engineer. Kneeling, left to right: Allen Braund, Supply Clerk, Anthony Poelstra, Groundman; Mr. Oleson presenting plaque to Freddie Baltezore, Foreman; Earl Foster, Lineman-Foreman; and Kaehl Volesky, Electronic Crew Foreman. Paul Aughenbaugh, Apprentice Electrician, was not available for the photograph. Photo PX-D-60761.

NATIONAL SAFETY COUNCIL SAFE DRIVER AWARDS

Typical of similar award presentations made throughout the Bureau was a recent ceremony in Boulder City, Nevada, at which 12 Reclamation employees of the Bureau's Region 3 Office were honored, having earned the Safe Driver Award of the National Safety Council. Shown below are (rear): George Graupensperger, 3-year award; Emerson E. Rhoades, 3-year award; Carl F. Mayrose, 6-year award; Michael I. Grogan, 4-year award; Grover Edmondson, 7-year award; Cecil E. McClaren, 4-year award; Leonard S. Stubbs, 3-year award; Front: Curtis M. Groom, 11-year award; Walter J. Nicks, 12-year award; Frank J. Kouba, Regional Safety Engineer presenting 21-year award to Marion E. Everhart. Not shown are James M. Murchison, 11-year award, and Benjamin E. Cope, 4-year award. Photo PX-D-61600.



* * * * *

FROM THE FIELD

Almena Division, Missouri River Basin Project, Kansas: Shown below is a safety fence constructed on old railroad trestle being used as a fishing bridge at Norton Reservoir. Fishermen interviewed indicated that they liked the handrail. The fence is constructed of half-round posts, 36-inch woven wire and 1-1/4-inch pipe handrails. The bridge is 103 feet long, and the work was accomplished in 6 hours by three men. Photo P492-701-1249NA.



Needles Field Division, Colorado River Front Work and Levee System: The photo below was taken during a Bureau of Mines First Aid Course given by Mrs. Mildred Rhoades at Needles, California. Men are demonstrating a dressing for a fractured back. Photo P423-306-5635NA.



South Platte River Projects, Loveland, Colorado--First Aid Demonstrated by Bureau Employees: A Loveland High School student is shown below practicing mouth-to-mouth resuscitation during a physical education class at which the Bureau of Reclamation manikin was used in a demonstration by A. L. Straub, left, and Ted McCormick, center. Photo P245-713-4129NA.



View showing some of the 279 Loveland High School students who practiced mouth-to-mouth resuscitation. Photo P245-713-4130NA.

* * * * *

SAFETY COMMITTEES

Presented at the Region 1 Safety Seminar
May 9 and 10, 1968 - Boise, Idaho

by
Norman H. Moore, Assistant Regional Director

Do you know there are an estimated 600 safety committees currently operating at various levels within the Department of the Interior? Many of these are within the Bureau of Reclamation. Six hundred is a large number, involving an even larger number of personnel. What these committees do and the effectiveness and efficiency of their operations are of great concern to all of us interested in safety and good business practices. So important is proper committee operation that we will take a closer look at committees in general, and safety committees in particular.

Experience demonstrates that while many safety committees are effective, some are not. Thus, it is a good idea to analyze the requirements of a safety committee to be better able to assure maximum effectiveness of all safety committees throughout our Region.

It is said that a committee keeps minutes but wastes hours. Like most cliches, this statement is not necessarily true. However, by our experience, we know there is enough truth to it to make us suspicious of the efficiency of committee action.

A study of modern managerial procedures will quickly demonstrate that committees can be effective and thus make positive contributions to resolving business problems. It is essential, however, that the problem area to be handled by any committee be clearly spelled out and understood by all involved. The committee mission and method of operation also must be understood. A committee must have firm leadership to keep members and committee actions zeroed in on the problem area and not stray to perhaps interesting but irrelevant subjects. Most important, a committee must have sufficient and pertinent information on which to act. Finally, it must operate in an environment where all participants feel free to submit their own ideas and honest opinions concerning the problem area. Committee action must not be dominated by one or a few persons.

Safety committees are not exceptions to the general rules of good committee action. So all the thoughts expressed above concerning committees in general apply with equal force to safety committees.

There are two basic functions of all safety committees. First, a safety committee should evaluate and provide guidance to the safety program. Second, it should serve as a source of advice and counsel to the Regional Director, office or project heads, and safety officers

in determining needs of the safety program and in establishing a safety policy. In carrying out these functions the committee must be cautious not to assume responsibility for the safety program, since basic overall responsibility for a safety program rests clearly with the supervisor directing the activity and his safety staff. The shifting of responsibility of a safety program to a safety committee should not be permitted.

The quality of the decisions of a safety committee depends greatly on the quantity and quality of information with which the committee has to work. For instance, the group discussions, conclusions and recommendations concerning accidents must be based on facts dealing directly with accident situations. There is no substitute for good factual information to provide the means for continual analysis of accident causes. Safety committees are dependent on such information if they are to successfully carry out their basic mission.

Any safety program has two major objectives: (1) to reduce to a minimum the number and severity of the employees' injuries, and (2) to reduce damage and other dollar losses resulting from accidents. Using proper leadership and good group discussion procedures, a safety committee can be a useful tool in aiding and promoting decisions and an effective safety program and can play an important role in achieving these two major objectives. This can be accomplished by the committee advising responsible authority such as the Regional Director, project manager, or operating office heads, regarding the continual development and coordination of accident prevention programs in the geographical area it represents.

A safety committee consists of the office head or his designated representative, the safety officer, and supervisors of the divisions representing the various work entities within the office. Such a group forms a broad representation of the organization and provides an excellent means of communication with all segments or parts of the organization. In this regard, safety committee members should be prodded continually to carry safety messages and ideas back to their individual offices. It should be understood that a safety program will not succeed with lip service alone but requires personal involvement on the part of all, especially safety committee members.

Another aid to communication is properly prepared safety committee meeting minutes, one copy of which should accompany the monthly committee safety report which is sent to the Regional Office. To be most effective, such minutes, when content warrants, should be distributed throughout the various levels of the local organization. After all, the best prepared minutes will do little good on the local level if they are only placed in a safety committee file.

In February 1967, we were directed by the Commissioner's Office to encourage union representation on Bureau safety committees. All offices in Region 1 were requested to comply with the full spirit and intent of this policy.

Unions in general recognize the importance of successful safety programs since such programs directly affect the welfare of union members. Union officers are interested in their members actively participating with safety committees. It is important that we cooperate in this respect and not have the attitude that safety is management's responsibility alone. We must realize that union support can make an important contribution to any safety program. Safety is everyone's responsibility, especially the line worker. In reality, it is he who makes or breaks a safety program.

We have not been too successful to date in obtaining active participation of union representatives on our various safety committees. Consequently, we must make an extra effort to encourage union members to attend safety committee meetings and counsel with us.

As has been previously indicated, a safety committee can produce good results only if it has good information with which to work. Accidents occur generally at the operating level and this is where you come into the picture. You can be alert to accident situations and facts concerning mishaps and make sure the facts are channeled to the appropriate safety committee.

Safety officers and staffs must provide the basic technical information and assistance to safety committees. This involves such items as:

- (1) Compilation and submission of accident data.
- (2) Continual analysis and evaluation of accident data and experiences.
- (3) The status and effectiveness of Bureau-conducted safety training programs.
- (4) The need for safety training programs.
- (5) Recommended procedures and policies to improve work methods and job conditions from a safety viewpoint.
- (6) Recognition of or ferreting out accident-producing conditions and circumstances and recommending necessary practical corrective actions.

These types of information permit analysis of safety problems by safety committees and enable the concentration on solution of problems. In this regard, it cannot be overemphasized that there must be followthrough on safety problems to produce desired results. We must not fall into the trap of collecting a lot of good information and data, building up a fine file, and then doing nothing with the information. Remember, the best of intentions do not produce results. It's the action that counts!

Let's take a few moments and cite a few examples of analysis of field information that might be presented to a safety committee. These are taken from actual accident data in Region 1 for the year 1967 and for 1968 through March 31.

Accident reports have been compiled on a regionwide basis and data presented in various ways. For instance, the Power Divisions throughout the Region experienced 36 percent of all accidents requiring medical care. Accident data for the new year through March 31, 1968, indicated that the same Power Divisions are experiencing 40 percent of the accidents during the current year. Thus, instead of improving, the Power Divisions' safety records are getting worse. These data then clearly indicate a group that apparently lives dangerously, and a group to be concentrated on in any safety program. By the way, the Irrigation Divisions are not much better in their accident experiences in the past few years, although so far in 1968 they are showing definite improvement. Also, from data collected in 1968, it is obvious that construction forces bear watching and some action should be taken since such forces have experienced 43 percent of all accidents in the Region as of March 31.

Accident data also have been tabulated by parts of the body which was injured, with a brief description of each specific injury and type of personnel involved. These data provide fertile fields to concentrate on in determining accident causes and preventative measures.

According to the statistics, the eyes seem to be receiving an unduly high percentage of the injuries. Does this mean that eye protection is not being utilized when it should? Also, what should be done to lower the incident of hand injuries, which type of injury has the dubious honor of leading the list in numbers experienced. Questions such as these should receive serious consideration.

Do older workers experience more injuries than the younger ones? One might jump to such a conclusion, but our data generally do not bear this out. If our data are correct, this means we have to attack the safety problem areas, not on age but on other bases.

By listing injuries by job classification, we find that drill crews have a particularly high incidence of injuries. In fact, in 1967, fifty percent of all drill crew members were injured on the job. Now here is an area where a properly directed safety campaign really would pay off.

Region 1's vehicle accident rate has been poor in recent years and requires serious consideration in any current safety program. The data show in 1967 that 90 percent of all vehicle accidents were preventable by Government drivers. Also that out of 12 accidents involving a third party, 10, or 83 percent, were the fault of the Government drivers.

Such statistics as these clearly point to problem areas and provide a basis for a real action program in safety. We could continue citing examples shown up by the compilation and analysis of accident data. It should be obvious that the collection and use of such data are important aids to any successful safety program.

Reclamation instructions require that safety committees meet at least once a month. Committee agendas should be prepared ahead of time and the meeting should be run with efficiency and dispatch. The length of meeting, of course, should be in accord with the subject matter to be considered but should generally run no longer than one hour. If, by chance, subject matter is scarce, keep the meeting short, but hold it since such a meeting affords the opportunity for all members of the committee to bring up safety items and most important, it provides another opportunity to bring the general subject of safety to the attention of an important group of people in the organization.

In summary, the success of any safety committee operation, or safety program, for that matter, depends greatly on the quantity and quality of the data available to it. The quantity and quality depends on you folks in the field on the so-called firing line where the action is. A safety committee meeting should be run efficiently and is held for the prime purpose of discussing safety items and taking effective actions on accident-producing conditions. Also, remember not only must we look backward at the causes of past accidents to prevent future accidents, but we must be ever alert to spot evolving conditions that are accident causative agents and then we must institute remedial action.

It is you people who hold the power in your hands to insure successful safety committee operation and a successful safety program. Please play a dynamic role. All of us need your full cooperation for a real humanitarian program. Your Regional Office management intends to do its part.

WATER SAFETY

DROWNINGS REDUCED BUT MORE SAFETY IS NEEDED

What has been done about the tragic drownings at water areas where people seek recreational pleasures?

Results of campaigns for water safety over a 6-year period are significant:

For each one million visitor-days at water resource facilities operated by the Bureau of Reclamation in 1961, there were three drownings.

In 1966, only 0.9 people drowned per one million visitor-days.

This is a significant reduction, especially in view of both the booming use of lakes by recreationists and the increasing availability of such bodies of water. Unquestionably, much credit for the improvement results directly from stepped-up safety efforts. (A visitor-day is defined as a significant time span spent by the visitor during a 24-hour day.)

Although the improvement shows Operation Westwide as succeeding, there are still problems, and the effort to curb drownings is continuing.

Operation Westwide is a plan for supplying ideas, leadership and programs in an attack on the drowning problems. Launched jointly by the Bureau of Reclamation and the American Red Cross in 1957, Reclamation's water safety efforts since that time steadily increased. This includes the construction of several kinds of physical barriers and devices to prevent drownings and aid in rescues around many of its structures. It also includes helping to set up education programs enlisting individual and community support.

DID YOU KNOW THAT---

Only about one-third of drowning victims are in the water swimming when they get into trouble?
Most of them fall in, or are pushed, etc.

San Luis Canal--San Luis Unit--Central Valley Project, California.
Shown below is one of three signs at Big Panoche Creek Siphon emphasizing the danger by stating "Entering This Siphon Would Result in Certain Death." Also note the buoy line across the canal for extra precaution. Photo P805-236-14106 NA.



RECORD OF PUBLIC DROWNINGS

January 1, 1968, through June 30, 1968

Bureau-operated Facilities:

Canals	10
Reservoirs	1
Total	<u>11</u>

Facilities Operated by Others:

Irrigation and Water Districts	3
State or County (Recreational)	28
Total	<u>31</u>

Summary of Total Drownings During Period:

By Operating Agency:

Bureau of Reclamation	11
Irrigation and Water Districts	3
State or County (Recreational)	28
Total	<u>42</u>

By Type of Facility:

Canals	13
Reservoirs	29
Total	<u>42</u>

By Activity:

Swimming	11
Boating	15
Fishing	1
Fell into water	10
Other	5
Total	<u>42</u>

By Age:

Under 12 years of age	8
From 12 to 25	18
From 25 to 50	10
Over 50 years of age	6
Total	<u>42</u>

* * * * *



What You Need To Stay Afloat

LAST SUMMER hundreds of sportsmen enjoying Coho salmon fishing in Lake Michigan were caught by a sudden storm.

Seven of them drowned.

Not one of the victims was found wearing any sort of life preserver. And they were just seven of the seven thousand persons who drowned in 1967—many without preserver protection.

Certainly fishermen and all others in open boats should be prepared for trouble at all times by having at hand the necessary flotation aids. In most areas laws require owners of recreational boats to have on board one Coast Guard approved lifesaving de-

vice for each person whether aboard or skiing.

This rule is not difficult to comply with for today's water safety gear is much improved over earlier bulky devices. However the variety of equipment available can be confusing. What is right for a skilled swimmer might not be adequate for a non-swimmer. What is fit for an adult is not proper for a child and vice versa. And, surprisingly, a large device may not offer as much flotation as a smaller one and a preserver with a lot of flotation material in the wrong place may be inferior to a less complicated one with flotation correctly distributed. Incorrect

buoyancy can be as disastrous as insufficient buoyancy.

These pages are designed to assist you in selecting water safety equipment suited to the person and the activity.

General Guidelines

Follow the Federal regulations that call for one Coast Guard approved lifesaving device for each person aboard or skiing. For small boats (Classes A, 1 and 2) this can be a life preserver, buoyant vest or cushion, ring buoy or appropriate special purpose buoyant device. Before purchasing any lifesaving device, look for the U. S. Coast Guard approval label

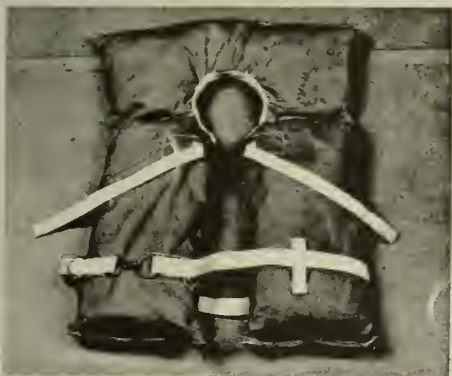
Life Preservers—These may be either of the jacket or bib design. The photo at the top of the page shows the newly approved bib design of unicellular plastic dipped foam with front split for ease of donning. Note how the preserver floats the wearer face up and slightly backwards.

Life preservers are most often of the kapok type, such as the jacket design shown at right. The bulkier cork and balsa types are acceptable by the Coast Guard if in serviceable condition.

Life preservers should be worn by non-swimmers when underway in small boats. In hazardous water, they should be worn by everyone. Properly stored in a dry, well-ventilated place, they will last for years. They are International Orange in color.



Buoyant Vests—Vests, which look very much like preservers, have less buoyancy and don't hold the wearer quite so high out of the water. Yet they are very popular because they are less bulky than most other devices. They should be donned before leaving the mooring and worn snugly by children and non-swimmers whenever underway in open boats. Vests can come in any color.



Buoyant Cushions—Cushions can be tossed like a buoy and are easy to grasp. They are not, however, recommended for children and non-swimmers because under some conditions they can be difficult to catch or hang onto while in the water. They should not be attached to the body like a jacket or vest. Sit on them for availability in time of emergency. Cushions are approved for the boat cockpit as supplementary equipment and are marked on the gusset. The plastic foam cushion below is vinyl dip coated. Check kapok and fibrous glass types for tears.



For the Young Ones—Child-size lifesaving devices are only for persons weighing less than 90 pounds. They should float the child on his back while keeping his face above water. Adults aren't supported properly by child-size equipment because of difference in weight and body build. Small children should not use adult devices since they might slip through them. Equipment that is oversized might also slide out of place and fail to hold a child upright in the water. It's a good idea to let each child personalize his own preserver by painting his name on it. Be sure to train children in donning equipment and let each see how his own device works in shallow water so he'll be used to it in an emergency.



Special Purpose Devices—Approved special purpose water safety devices are manufactured in many designs to fit special needs. These buoyant devices include equipment for water skiers, hunters and motorboat racers. They should be used only for intended special purposes because they do not fulfill all the functions of a standard preserver. Special purpose devices are usually designed for experienced swimmers or skiers. The skier's vest at right is one approved special purpose device. Ski belts are not approved because of insufficient buoyancy and failure to assure face-up flotation. Although the belts fail to meet Coast Guard approval, they are very popular with experienced swimmers and are frequently regarded as supplemental equipment.



U.S. Coast Guard photos

VEHICLE SAFETY

ALCOHOL, DRUGS, AND ACCIDENTS --

HOW ARE THEY RELATED?

Reproduced from "Safety Newsletter"
with permission from the National
Safety Council

In 1965, 49,000 human lives were sacrificed on the nation's traffic altar. In 1966, the national traffic fatality figure soared to 53,000. Official figures for 1967 undoubtedly will be higher.

Some of the accidents have been cataloged easily. For example, where the driver was speeding, the evidence was quite obvious. In other instances, witnesses observed the drivers swerving about or otherwise in trouble immediately before the accident. In many cases, there were no definite explanations, because the drivers appeared normal, but suddenly left the road and were killed. Possible causes were many.

Were they under the influence of alcohol or drugs? Did they suffer heart attacks? Were they victims of highway hypnosis? Did fatigue overtake them? Was carbon monoxide a factor? Or could it have been a carefully planned suicide?

With financial support from the U.S. Bureau of Public Roads, the California Highway Patrol has made an in-depth, 24-month investigation of such accidents in a state where nearly 5000 persons lose their lives on the highway each year.

Evidence indicated that alcohol would prove a major contributor to California's single-vehicle fatalities. However, other facts also seemed suspect. There had been, for example, considerable talk of carbon monoxide effects in closed cars, even during operation on the highways.

Facts also pointed to the use of various drugs being on the increase. To further compound the problem, there was little information as to the effect of drugs combined with alcohol.

As expected, alcohol proved to be a big factor in accidents. Of 772 drivers tested, 74 per cent had alcohol in their blood at the time of death. The average blood-alcohol level of these 573 persons was .22 per cent by weight, the equivalent of from 11 to 14 one-ounce drinks. The study revealed that 66 per cent of the drivers at time

of death had alcohol levels of .10 per cent or more. This is a level at which most medical authorities agree all drivers are sufficiently under the influence of alcohol to impair their driving ability. A complete analysis made it clear that in the single-vehicle fatality accident the crux of the problem was not with the social or casual drinker, but the seasoned toper.

A basic dissatisfaction with life leading to excessive drinking appeared to be manifested, in some instances associated with suicidal intent. While the results of the survey did not provide conclusive proof as to the extent of drug involvement in this type of accident, the fact that almost 13 per cent of all drivers had some level of drugs in their systems was significant.

Now, that the first step has been taken to gain detailed information concerning our soaring highway fatality rate, it is important to proceed with an action program to effect needed changes. In this direction, a project already is under consideration in California to measure drinking exposure, an on-the-road investigation; and further cooperative planning is to be carried on with the U.S. Bureau of Public Roads and the U.S. Department of Transportation.

-- H. M. Whitman
Vice-President
Curtis 1000, Inc.
Reprinted From:
The Curtis Courier

SAFETY BELT STILL TOP LIFESAVER

Speaking at the site of the National Safety Council's Winter Driving Tests at Stevens Point, Donald Huelke, professor of anatomy at the University of Michigan, said that instead of demanding more safety features in cars, the public should make use of the features already available. Stating that the safety belt still is the key to saving lives, he said that in his recent studies of 139 fatal accidents, 40 percent of the 177 persons killed would have been saved had they been wearing lap belts. Another 13 per cent would have been saved if shoulder belts had also been used. "We could save the lives of one-half of the people killed in crashes in the United States if everyone wore seat and shoulder belts," he said.

AUTO POWER WINDOWS EVOKE WARNING

The National Highway Safety Bureau has warned parents against leaving children unattended in cars with power windows.

In a statement by Dr. William Haddon, Jr., Director of the Bureau in the Department of Transportation's Federal Highway Administration, owners of cars equipped with power were told:

Despite extensive publicity given in the past to incidents of strangulation, loss of fingers, and other injuries to children and adults from automobile power windows, tragedies of this kind are being reported to the Bureau in increasing numbers.

We ask news media, safety organizations, and allied interests, therefore to stress the following hazards and precautions concerning power windows:

1. Children, left unattended in automobiles, often play with power window switches. The results can be--and have been--death through strangulation, cutting off of or injury to limbs, and other damage to small children. Do not leave small children unattended in automobiles with power windows.

2. Although some current car models are designed so that the power windows cannot be operated when the key is in the "off" position, most cars do not have this feature. If your car's power windows operate when the key is off, have a mechanic or dealer adjust the wiring so that the windows cannot operate unless the ignition switch is on. This is a fairly simple and inexpensive modification.

3. In purchasing a new car, ask your dealer whether the power windows can be closed when the key is off. If they can, have the system adjusted to prevent their being closed when the key is off.

4. As with all other motor vehicles, cars with power windows should be left completely locked when not in use. This not only greatly reduces the chances of theft, but also prevents inquisitive children from injuring themselves with power windows, cigarette lighters, and other dangerous equipment, or by releasing the brake.

Parents must be alerted to the dangers of leaving their children alone in cars with power windows, when the risk exists of playful closing of the window with resulting death or injury to the youngster.

* * * * *

TUNNELING: RECOMMENDED SAFETY RULES

The Bureau of Mines has revised its bulletin covering safety measures to take while tunneling. Bureau of Mines Bulletin 644 (a revision of Bulletin 439), entitled "Tunneling: Recommended Safety Rules," can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 for 40¢ a copy (paper cover).

* * * * *

DOES SAFETY AWARENESS PAY OFF?

For those of our employees who believe that we may be overly sensitive to the needs of safety, a review of the loss of life during construction of the Coulee Dam in the year 1936 may be of interest. What follows was taken from a year-end summary published in one of the state papers on the first of January 1937. In this summary they took the activities month by month, and quite a few of these months reported the death of workers on the job.

Howard Snyder fell to his death in a shaft in January. William Johnson was crushed by a concrete car in March. Tom Halverson was killed by a falling boom in April. Halverson was the twentieth accident victim since dam construction had commenced. Also in April, James Slete was killed under a concrete train, and James Rayburn died of a skull fracture. James McAllister was killed as a result of a 30-foot fall in May. In July the body of the wife of one of the workers was found dead in the river. Warren Pickle was killed on the job in August, and the traffic death on the damsite highways totaled eight that month. Welder Andrew Speer was killed in September. In October Al Cook was electrocuted, and Thomas Lewis, truck driver, died from crushing. Alex Bruce, a carpenter, died from a fall in November, and, although reasons are not given, the paper announced that three more workers were killed in a week's time in December. That's the way it was, boys, in the good old days. We like it better now!

* * * * *

DID YOU KNOW THAT---

Surveys show that workers who skip breakfast are more likely to have accidents?

Many hair sprays are highly flammable while being sprayed? A cigarette, match, or even a hot light bulb could turn a hair spray can into a blow torch.

* * * * *

NATIONAL SAFETY COUNCIL DATA SHEETS

The National Safety Council has recently published new or revised technical data sheets on the subjects listed below. Copies of these data sheets (by the numbers shown in parentheses) may be obtained from the National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611.

Electric Hand Saws, Circular Blade Type (344 Revised)
Printer-Slotters (348, Revision A)
Electromagnets Used With Crane Hoists (359, Revision A)
Industrial Ethyl Alcohol (391)
Methanol (407, Revision A)
Aniline (409, Revision A)
Firearms for Plant Protection (413, Revision A)
Pipeline Radiography (600)
Ammonium Nitrate/Fuel Oil Mixtures in Underground Mines (604)
Extruders and Strainers in the Rubber and Plastics Industries (610)
Scrap Ballers (611)
Photography for the Safety Professional (619)

GANG TOOL BOX ACCIDENTS

Reproduced from Construction Safety
Release No. 67 with permission from
the National Safety Council

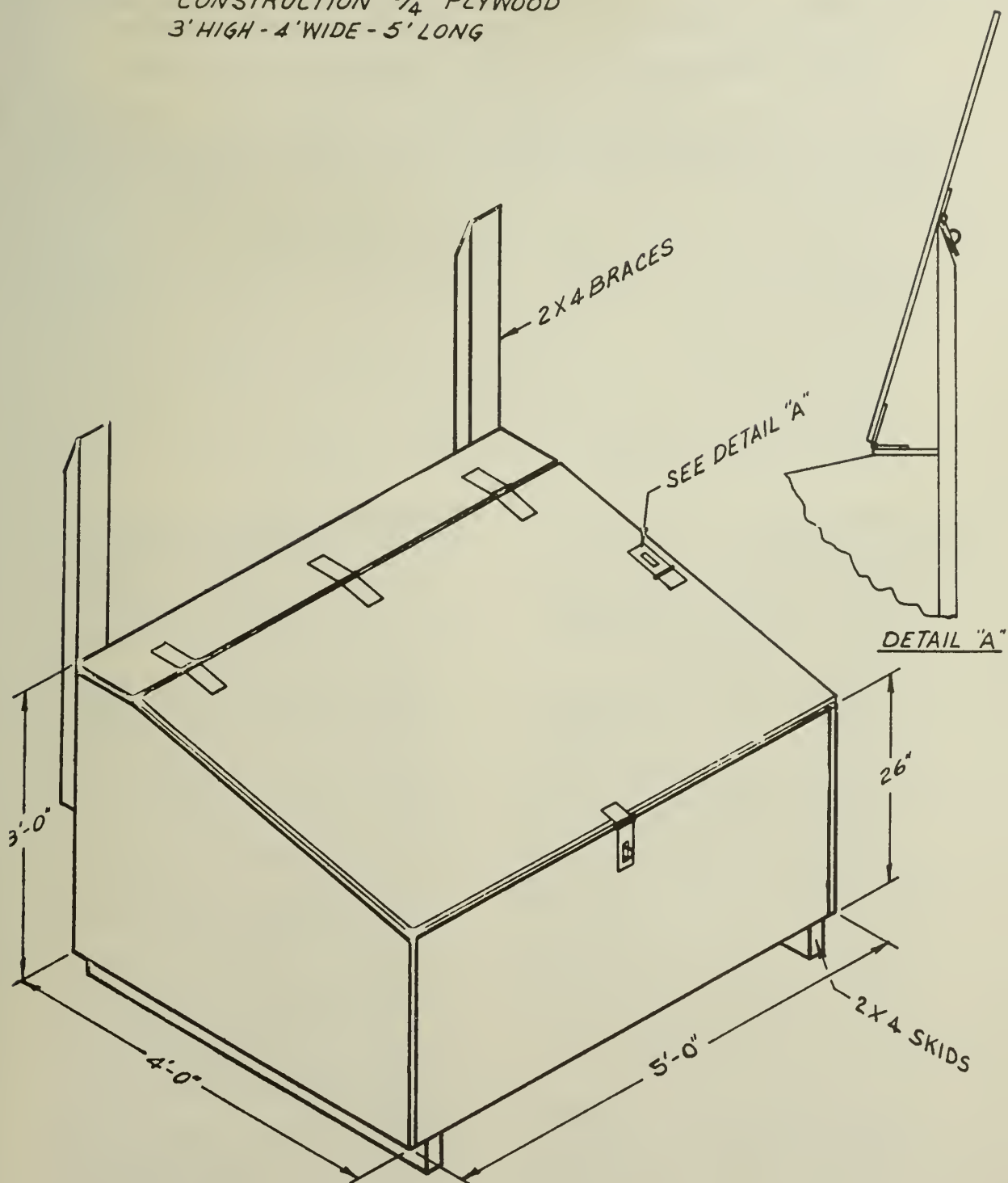
On most construction jobs today we find many large tool boxes placed at various locations and elevations throughout the jobsite. The primary purpose for these boxes is to store special types of tools or equipment which is used from day to day or on consecutive shifts. This usually eliminates loss of time and money caused by frequent trips to and from main toolrooms or warehouses.

Minor and serious accidents, even fatalities have been attributed to the heavy lids of such tool boxes falling and striking workmen on the fingers, arms, head or shoulders.

Corrective measures should be taken to eliminate this type of accident. One method is to install a pulley arrangement with counterweight for holding up the lid. Another arrangement is the use of an extra 8-inch hasp attached to box lid with a lock open feature. (See drawing on opposite page.)

---John G. Sellers
Combustion Engineering, Inc.

GANG BOXES WITH LOCK OPEN FEATURE
CONSTRUCTION $\frac{3}{4}$ " PLYWOOD
3' HIGH - 4' WIDE - 5' LONG



STEEL SCAFFOLDING SAFETY RULES

as Recommended by

STEEL SCAFFOLDING AND SHORING INSTITUTE

(SEE SEPARATE SHORING SAFETY RULES)

Following are some common sense rules designed to promote safety in the use of steel scaffolding. These rules are illustrative and suggestive only, and are intended to deal only with some of the many practices and conditions encountered in the use of scaffolding. The rules do not purport to be all-inclusive or to supplant or replace other additional safety and precautionary measures to cover usual or unusual conditions. They are not intended to conflict with, or supersede, any state or local statute or regulation; reference to such specific provisions should be made by the user. (See Rule II.)

- I. **POST THESE SCAFFOLDING SAFETY RULES** in a conspicuous place and be sure that all persons who erect, dismantle or use scaffolding are aware of them.
 - II. **FOLLOW ALL STATE, LOCAL AND GOVERNMENT CODES, ORDINANCES AND REGULATIONS** pertaining to scaffolding.
 - III. **INSPECT ALL EQUIPMENT BEFORE USING**—Never use any equipment that is damaged or deteriorated in any way.
 - IV. **KEEP ALL EQUIPMENT IN GOOD REPAIR.** Avoid using rusted equipment—the strength of rusted equipment is not known.
 - V. **INSPECT ERECTED SCAFFOLDS REGULARLY** to be sure that they are maintained in safe condition.
 - VI. **CONSULT YOUR SCAFFOLDING SUPPLIER WHEN IN DOUBT**—scaffolding is his business, **NEVER TAKE CHANCES.**
-
- A. **PROVIDE ADEQUATE SILLS** for scaffold posts and use base plates.
 - B. **USE ADJUSTING SCREWS** instead of blocking to adjust to uneven grade conditions.
 - C. **PLUMB AND LEVEL ALL SCAFFOLDS** as the erection proceeds. Do not force braces to fit—level the scaffold until proper fit can be made easily.
 - D. **FASTEN ALL BRACES SECURELY.**
 - E. **DO NOT CLIMB CROSS BRACES.**
 - F. **ON WALL SCAFFOLDS PLACE AND MAINTAIN ANCHORS** securely between structure and scaffold at least every 30' of length and 25' of height.
 - G. **WHEN SCAFFOLDS ARE TO BE PARTIALLY OR FULLY ENCLOSED**, specific precautions must be taken to assure frequency and adequacy of ties attaching the scaffolding to the building due to increased load conditions resulting from effects of wind and weather. The scaffolding components to which the ties are attached must also be checked for additional loads.
 - H. **FREE STANDING SCAFFOLD TOWERS MUST BE RESTRAINED FROM TIPPING** by guying or other means.
 - I. **EQUIP ALL PLANKED OR STAGED AREAS** with proper guard rails, and add toeboards when required.
 - J. **POWER LINES NEAR SCAFFOLDS** are dangerous—use caution and consult the power service company for advice.
 - K. **DO NOT USE ladders or makeshift devices** on top of scaffolds to increase the height.
 - L. **DO NOT OVERLOAD SCAFFOLDS.**
 - M. **PLANKING:**
 1. Use only lumber that is properly inspected and graded as scaffold plank.
 2. Planking shall have at least 12" of overlap and extend 6" beyond center of support, or be cleated at both ends to prevent sliding off supports.
 3. Do not allow unsupported ends of plank to extend an unsafe distance beyond supports.
 4. Secure plank to scaffold when necessary.
 - N. **FOR ROLLING SCAFFOLD THE FOLLOWING ADDITIONAL RULES APPLY:**
 1. **NO NOT RIDE ROLLING SCAFFOLDS.**
 2. **REMOVE ALL MATERIAL AND EQUIPMENT** from platform before moving scaffold.
 3. **CASTER BRAKES MUST BE APPLIED** at all times when scaffolds are not being moved.
 4. **CASTERS WITH PLAIN STEMS** shall be attached to the panel or adjustment screw by pins or other suitable means.
 5. **DO NOT ATTEMPT TO MOVE A ROLLING SCAFFOLD WITHOUT SUFFICIENT HELP**—watch out for holes in floor and overhead obstructions.
 6. **DO NOT EXTEND ADJUSTING SCREWS ON ROLLING SCAFFOLDS MORE THAN 12".**
 7. **USE HORIZONTAL DIAGONAL BRACING** near the bottom and at 20' intervals measured from the rolling surface.
 8. **DO NOT USE BRACKETS ON ROLLING SCAFFOLDS** without consideration of overturning effect.
 9. **THE WORKING PLATFORM HEIGHT OF A ROLLING SCAFFOLD** must not exceed four times the smallest base dimension unless guyed or otherwise stabilized.
 - O. For "PUTLOGS" and "TRUSSES" the following additional rules apply:
 1. **DO NOT CANTILEVER OR EXTEND PUTLOGS/TRUSSES** as side brackets without thorough consideration for loads to be applied.
 2. **PUTLOGS/TRUSSES SHOULD EXTEND AT LEAST 6"** beyond point of support.
 3. **PLACE PROPER BRACING BETWEEN PUTLOGS/TRUSSES** when the span of putlog/truss is more than 12".
 - P. **ALL BRACKETS** shall be seated correctly with side brackets parallel to the frames and end brackets at 90 degrees to the frames. Brackets shall not be bent or twisted from normal position.
 - Q. **ALL SCAFFOLDING ACCESSORIES** shall be used and installed in accordance with the manufacturers recommended procedure. Accessories shall not be altered in the field.

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REV. 2-29-68-5M

STEEL FRAME SHORING SAFETY RULES

As Recommended by


STEEL SCAFFOLDING AND SHORING INSTITUTE

(See Separate Scaffolding Safety Rules and Recommended Steel Frame Shoring Erection Procedure)

Following are some common sense rules designed to promote safety in the use of steel frame shoring equipment. These rules are illustrative, and are intended to deal only with some of the many practices and conditions encountered in the use of steel frame shoring. The rules do not purport to be all-inclusive or to supplant or replace other additional safety and precautionary measures. They are not intended to conflict with, or supersede, any state or local statute or regulation; reference to such specific provisions should be made by the user. (See Rule II)

- I. **POST THESE SHORING SAFETY RULES** in a conspicuous place and be sure that all persons who erect, dismantle or use shoring frames are aware of them.
 - II. **FOLLOW LOCAL CODES, ORDINANCES and REGULATIONS** pertaining to shoring.
 - III. **INSPECT ALL EQUIPMENT BEFORE USING.** Never use any equipment that is damaged or deteriorated in any way.
 - IV. **A SHORING LAYOUT**—Should be available on the jobsite at all times.
 - V. **INSPECT ERECTED SHORING AND FORMING:**
 - a. Immediately prior to pour - b. During pour - c. Immediately after pour.
 - VI. **CONSULT YOUR SHORING EQUIPMENT SUPPLIER WHEN IN DOUBT.** Shoring is his business, **NEVER TAKE CHANCES.**
-
- A. **USE MANUFACTURER'S RECOMMENDED SAFE WORKING LOADS CONSISTENT WITH** the type of **SHORING FRAME** and the height from supporting sill to formwork.
 - B. **DO NOT EXCEED THE SHORE FRAME SPACINGS OR TOWER HEIGHTS** as shown on the shoring layout.
 - C. **SHORING LOAD SHOULD BE CARRIED ON LEGS.** Consult your shoring supplier for **SHORING FRAMES** that are designed for taking loads on top horizontal.
 - D. **IF MOTORIZED CONCRETE EQUIPMENT** is to be used, be sure that the shoring layout has been designed for use with this equipment and such fact is noted on the layout.
 - E. **PROVIDE AND MAINTAIN A SOLID FOOTING** to distribute maximum loads properly.
 - F. **USE ADJUSTMENT SCREWS** to adjust to uneven grade conditions.
 - G. **USE ADJUSTMENT SCREWS** to level-off, to accurately position the falsework and for easy stripping.
 - H. **KEEP SCREW EXTENSIONS** to a minimum for maximum load carrying capacity (follow manufacturer's recommendation on screw extension).
 - I. **MAKE CERTAIN THAT ALL ADJUSTMENT SCREWS** are firmly in contact with sills, formwork and frame legs.
 - J. **PLUMB AND LEVEL ALL SHORING FRAMES** as the erection proceeds. **DO NOT** force braces on frames to fit—level the shoring towers until proper fit can be made easily. **CHECK PLUMB AND LEVEL OF SHORING TOWERS** just prior to pour.
 - K. **FASTEN ALL BRACES SECURELY.**
 - L. **TIE HIGH TOWERS OF SHORING FRAMES TOGETHER** with sufficient braces to make a rigid, solid unit (see manufacturer's recommendations).
 - M. **EXERCISE CAUTION** in erecting or dismantling free standing shoring towers to prevent tipping.
 - N. **DO NOT CLIMB CROSS BRACES.**
 - O. **AVOID ECCENTRIC LOADS ON U-HEADS,** top plates and similar members by centering stringers on those members.
 - P. **USE SPECIAL PRECAUTIONS** when shoring from or to sloped surfaces.
 - Q. **USE LUMBER STRESSES** as shown on layout and consistent with age, type and condition of the available lumber to be used. Use only lumber that is in good condition.
 - R. **RESHORING PROCEDURE SHOULD BE APPROVED BY A QUALIFIED ENGINEER.**
 - S. **DO NOT REMOVE BRACES OR BACK-OFF ON ADJUSTMENT SCREWS** until proper authority is given.

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SINGLE POST SHORE SAFETY RULES

As Recommended by

STEEL SCAFFOLDING AND SHORING INSTITUTE

(See Separate Scaffolding Safety Rules, Shoring Safety Rules, Recommended Steel Frame Shoring Erection Procedure, Recommended Standard Safety Code for Vertical Shoring.)

Following are some common sense rules designed to promote safety in the use of Single Post Shores. These rules are illustrative, and are intended to deal only with some of the many practices and conditions encountered in the use of Single Post Shores. The rules do not purport to be all-inclusive or to supplant or replace other additional safety and precautionary measures. They are not intended to conflict with, or supersede, any state or local statute or regulation; reference to such specific provisions should be made by the user. (See Rule II)

- I. **POST THESE SINGLE POST SHORE SAFETY RULES** in a conspicuous place and be sure that all persons who erect, dismantle or use Single Post Shores are aware of them.
 - II. **FOLLOW ALL STATE, LOCAL AND GOVERNMENT CODES, ORDINANCES AND REGULATIONS** pertaining to shoring.
 - III. **INSPECT ALL EQUIPMENT BEFORE USING.** Never use any equipment that is damaged or deteriorated in any way.
 - IV. **INSPECT ERECTED SHORING AND FORMING:**
 - a. Immediately prior to pour - b. During pour - c. Immediately after pour.
 - V. **CONSULT YOUR SHORING EQUIPMENT SUPPLIER WHEN IN DOUBT.** Shoring is his business, **NEVER TAKE CHANCES.**
-
- A. **USE MANUFACTURER'S RECOMMENDED SAFE WORKING LOADS** consistent with the height from supporting sill to formwork.
 - B. **PROVIDE AND MAINTAIN A SOLID FOOTING** to distribute maximum loads properly.
 - C. **PLUMB ALL POST SHORES AS THE ERECTION PROCEEDS.** Check plumb of post shores **JUST PRIOR TO POUR.**
 - D. **CHECK TO SEE THAT ALL CLAMPS, SCREWS, PINS** and all other components are in a **CLOSED OR ENGAGED POSITION.**
 - E. **MAKE CERTAIN THAT ALL BASE PLATES AND SHORE HEADS ARE IN FIRM CONTACT** with **THE FOOTING SILL AND FORM MATERIAL.**
 - F. **IF MOTORIZED CONCRETE EQUIPMENT IS TO BE USED,** be sure that post shores are **SPACED AND BRACED WITH THIS FACT IN MIND.**
 - G. **FOR STABILITY, SINGLE POST SHORES SHALL HAVE ADEQUATE BRACING** provided in the longitudinal, transverse and diagonal directions.
 - H. **DEVICES WHICH ATTACH TO THE EXTERNAL LATERAL STABILITY BRACING** shall be securely fastened to the single post shores.
 - I. **SINGLE POST SHORES MORE THAN ONE TIER HIGH SHOULD NOT BE USED.** Where greater shore heights are required consult the supplier.
 - J. **ADJUSTMENT OF SINGLE POST SHORES TO RAISE FORMWORK** shall not be made after concrete is in place.
 - K. **AVOID ECCENTRIC LOADS ON U-HEADS, AND TOP PLATES** by centering stringers on those members.
 - L. **USE SPECIAL PRECAUTIONS** when shoring from or to sloped surfaces.
 - M. **RESHORING PROCEDURE** should be approved by a qualified engineer.
 - N. **DO NOT BACK-OFF OR STRIP POST SHORES** until proper authority is given.
 - O. **USE LUMBER STRESSES** consistent with age, type and condition of available lumber to be used. Use only lumber that is in good condition.

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12-8-66-25M

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

2nd QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH June 30, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL *			
Washington Office	335	344,808					
Denver Office	1,405	1,407,744	1		11	0.7	8
REGION 1							
Boise Regional Office	183	182,398					
Baker Project	7	10,975					
Central Snake Project	45	40,318					
Chief Joseph Dam Project	37	36,982					
Columbia Basin Project	953	955,568	1		17	1.0	18
Green Springs Powerplant	2	2,146					
Hungry Horse Project	50	49,551					
Lower Columbia Development Office	48	41,779					
Mann Creek Project		1,972					
Minidoka Project	67	68,823					
SNAKE River Development Office	69	61,560					
Spokane Valley Project		2,594					
Third Powerplant Construction Off.	182	176,614	2		150	11.3	849
Upper Columbia Development Office	52	45,574					
Wild Horse Dam	26	15,446					
Yakima Project	34	26,638					
Totals & Averages	1,755	1,688,928	3		167	1.8	99
REGION 2							
Sacramento Regional Office	591	644,750	1		3	1.6	5
Regional Drill Crews	35	41,526	1		100	24.1	2,408
Auburn-Folsom South Unit CVP	171	151,771					
Cachuma Operations Field Branch	2	2,032					
Central Coast Development Field Br.	3	3,520					
Folsom Field Division	72	69,737					
Fresno CVP Construction Office	120	112,134					
Fresno Field Division	136	141,240					
Klamath Project Office	24	20,757					
Klamath Basin Projects Office	69	65,192					
Mapa Development Field Branch	1	3,048					
Red Bluff CVP Construction Office	36	44,016					
San Luis Unit CVP Construction Office	211	277,576					
Shasta Field Division	137	138,986					
Solano Operations Field Branch	2	2,032					
Tracy Field Division	156	164,489					
Transmission Lines Office, Reno	7	15,262					
Upper North Coast Dev. Field Branch	4	4,071					
Willows CVP Construction Office	112	105,896					
Totals & Averages	1,891	2,009,085	2		103	1.0	51
REGION 3							
Boulder City Regional Office	226	179,680					
Boulder Canyon Project	160	151,908					
Dixie Project	5	5,160					
Lower Colorado River Project	193	180,031	1		83	5.6	461
Head Construction Office	26	25,199					
Parker-Davis Project	302	350,975					
Phoenix Development Office	94	90,880					
Southern California Dev. Office	36	36,180					
Southern Nevada Water Project	42	40,213					
Yuma Projects	161	154,880	1		90	6.5	581
Totals & Averages	1,252	1,215,106	2		173	1.6	142
REGION 4							
Salt Lake City Regional Office	236	225,910					
Central Utah Projects	201	206,211					
CRSP Montrose	284	292,105					
Curecanti Unit	78	85,851					
Durango Projects Office	29	33,057					
Grand Junction Projects Office	47	56,140					
Logan Development Office	9	9,360					
Lyman Project	34	25,520					
Upper Green River Development Off.	19	17,108					
Weber Basin Project	58	61,504	1		17	16.2	275
Totals & Averages	995	1,012,966	1		17	1.0	17
REGION 5							
Amarillo Regional Office	104	103,289					
Albuquerque Development Office	32	35,674					
Arbuckle Project	2	3,520					
Austin Development Office	47	49,104					
Canadian River Project	22	38,481					
Lower Rio Grande Project	2	2,032					
Middle Rio Grande Project	202	219,365					
Navajo Project	81	87,612					
Oklahoma City Development Office	22	18,522					
Pecos River Project	7	6,381					
Rio Grande Project	219	224,420					
San Juan-Chama Project	81	82,363					
Totals & Averages	821	869,763					
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

2nd QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 -- THROUGH -- June 30, 1968.

[illegible]

SAFETY PERFORMANCE RECORD
CUMULATIVE QUARTERLY REPORT
CONTRACTOR FORCES

2nd QUARTER, 1968

PERIOD FROM JANUARY 1, 1968.. THROUGH.....JUNE 30, 1968...

PERIOD FROM JANUARY 1, 1967 THROUGH DECEMBER 31, 1967							
REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL #	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 1							
Baker Project	2	8,260					
Chief Joseph Dam Project	49	21,697					
Columbia Basin Project	161	181,481	3		79	16.5	435
Green Springs Powerplant		34					
Hungry Horse Project		103					
Mann Creek Project		1,071					
Minidoka Project		18,210	2		81	109.8	4,448
Snake River Development Office	4	5,101					
Spokane Valley Project		266					
Third Powerplant Construction Office	495	429,294	5		411	11.6	957
Wild Horse Dam	33	16,866					
Yakima Project	5	12,674					
Totals & Averages	749	695,057	10		571	14.4	822
REGION 2							
Auburn-Folsom South Unit CVP Office	36	38,349					
Folsom Field Division		204					
Fresno CVP Construction Office	111	76,419	1		44	13.1	576
Fresno Field Division		1,223					
Lahontan Basin Projects Office	182	78,781	1		31	12.7	393
Red Bluff CVP Construction Office	55	56,136					
San Luis Unit CVP Constr. Office	108	100,670					
Tracy Field Division	2	237					
Willows CVP Construction Office	163	107,647					
Totals & Averages	657	459,666	2		75	4.4	163
REGION 3							
Boulder Canyon Project	6	790					
Lower Colorado River Project	107	78,046					
Mead Construction Office	30	66,959					
Parker-Davis Project	28	25,082					
Southern California Dev. Office		2,954					
Southern Nevada Water Project	7	778					
Yuma Projects	49	43,066	1		60	23.2	1,393
Totals & Averages	227	217,705	1		60	4.6	276
REGION 4							
Central Utah Project	281	148,756	3		89	20.1	598
CRSP Montrose	45	5,356	1		30	185.3	5,560
Curecanti Unit	69	102,139	1		10	9.8	98
Durango		2,000					
Grand Junction Projects Office		300					
Ignman Project	47	8,213					
Upper Green River	4	2,290					
Weber Basin Project	26	14,432					
Totals & Averages	472	283,526	5		129	17.6	455
REGION 5							
Amarillo Regional Office	3	875					
Arbuckle Project	1	2,581					
Canadian River Project	11	10,253					
Navajo Project	237	285,024	6		90	21.1	316
Pecos River Basin Project	3	2,318					
Rio Grande Project	3	2,341					
San Juan-Chama Project	519	616,014	6	1	6,129	9.7	9,949
Totals & Averages	777	926,366	12	1	6,219	13.0	6,733
REGION 6							
Missouri-Oaks Projects	59	11,763					
Missouri-Souris Projects	19	7,928					
Riverton Project	19	6,246					
Upper Missouri Projects	145	90,265					
Yellowtail Construction Office	73	67,270	1		21	14.9	312
Totals & Averages	315	183,472	1		21	5.5	114
REGION 7							
Fryingpan-Arkansas Project	504	548,609	12		132	21.9	241
Glen Elder Unit	231	210,194					
Kansas River Projects	16	11,263					
Nicholls-Lower Platte Dev. Office	8	1,504					
North Platte River Projects	4	13,177					
South Platte River Projects	2	1,002					
Totals & Averages	766	785,749	12		132	15.3	168
CONSOLIDATED TOTALS							
	3,963	3,551,541	43	1	7,207	12.1	2,089
TOTALS LAST YEAR (1967)	3,975	10,218,673	155	5	35,271	15.2	3,452

*FATALITIES INCLUDED IN TOTAL DISABLING

MOUTH TO MOUTH RESUSCITATION

USE THIS METHOD ON DROWNING VICTIMS, ELECTRIC SHOCK, GAS POISONING AND SUFFOCATION TO AVOID DIRECT CONTACT PLACE A HANDKERCHIEF OVER VICTIM'S MOUTH THIS WON'T IMPEDE AIR FLOW



EXAMINE VICTIM'S MOUTH FOR FOREIGN MATTER. IF THERE IS ANY (MUCUS, FOOD, SAND, TOBACCO, LOOSE DENTURES, ETC.) TURN HIS HEAD TO ONE SIDE AND REMOVE IT WITH YOUR FINGERS OR A CLOTH WRAPPED AROUND YOUR FINGERS.



LIFT THE VICTIM'S NECK, PLACE A FOLDED COAT, BLANKET, ETC. UNDER HIS SHOULDERS.



TILT HIS HEAD BACK AS FAR AS POSSIBLE, MAINTAIN THIS POSITION TO KEEP AIR PASSAGE OPEN.



PINCH VICTIM'S NOSTRILS SHUT. OPEN YOUR MOUTH WIDE, MAKE A TIGHT SEAL WITH YOUR MOUTH OVER HIS MOUTH, OR HIS NOSE. BLOW INTO VICTIM'S MOUTH OR NOSE UNTIL YOU SEE HIS CHEST RISE. FOR AN INFANT, BREATHE THROUGH BOTH MOUTH AND NOSE.



REMOVE YOUR MOUTH AND LISTEN FOR OUTFLOW OF AIR. FOR AN ADULT, INFLATE LUNGS AT RATE OF ABOUT 12 TIMES PER MINUTE. FOR A CHILD, INFLATE LUNGS UP TO 20 TIMES PER MINUTE, USING RELATIVELY SHALLOW BREATHS.



IF FIRST FEW ATTEMPTS TO INFLATE THE LUNGS ARE UNSUCCESSFUL, TURN VICTIM ON HIS SIDE AND ADMINISTER SEVERAL SHARP BLOWS BETWEEN THE SHOULDERS. TRY TO DISLODGE THE OBSTRUCTION. REPEAT ENTIRE PROCEDURE.

DON'T GIVE UP UNTIL ALL HOPE IS GONE

MISSION
SAFETY

70

RECLAMATION SAFETY NEWS



Third Quarter 1968

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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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Safety Performance Record	
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Front Cover Photo: International "farm-type" tractor with front- end loader and backhoe attachments with a rollover protective system and a seat belt. Bureau of Reclamation Photo P526-412- 11077 NA.	

SAFETY NEWS is published quarterly by the Office of
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accident prevention.

BUREAU SAFETY PERFORMANCE

1968 CUMULATIVE SAFETY RECORD

January 1 - September 30, 1968

A. GOVERNMENT FORCES:

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 6	0.04	0.8	5	1.8
Region 5	0.09	0.8	11	3.4
Region 7	0.1	1.3	8	2.9
Region 4	0.2	1.3	18	1.7
Region 2	0.7	1.3	52	1.5
Region 3	1.0	1.1	94	3.9
Region 1	<u>1.3</u>	<u>1.6</u>	<u>81</u>	<u>3.3</u>
Totals to date	0.4	1.1	39	2.6
<hr/>				
Totals	18.0	2.7	665	3.1

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES:

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 2	2.9	2.4	119	0
Region 6	4.7	5.6	84	0
Region 3	7.0	3.4	206	0
Region 4	17.3	8.2	211	0
Region 1	84.1	12.5	673	0
Region 5	1280.9	14.0	9, 149	2
Region 7	<u>2160.9</u>	<u>20.5</u>	<u>10, 541</u>	<u>2</u>
Totals to date	525.7	11.7	4, 493	4
<hr/>				
Totals 1967	524.7	15.2	3, 452	5

C. RECLAMATION CIVILIAN CONSERVATION CENTERS:

Frequency rate	2.8
Severity rate	3, 226
Vehicle accident rate	14.9

LOST TIME ACCIDENT ANALYSIS

Government Forces - 1968
Third Quarter

Cumulative to Date:
September 30, 1968

A. ACCIDENT CLASSIFICATION:

<u>Description</u>	<u>No.</u>	<u>Days lost</u>
Vehicles	3	136
Hand tools	1	11
Falls of persons	5	171
Handling materials or equipment	8	289
Total	17	607

B. OPERATIONAL SUMMARY:

<u>Operation</u>	<u>Man-hours</u>	<u>No. of accidents</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration, Clerical and Design	6,425,173	3	16	0.5	2
Construction	2,505,440	5	329	2.0	131
Investigation	1,751,447	1	100	0.6	57
Power O&M	2,907,920	3	54	1.0	19
Irrigation O&M	2,021,043	5	108	2.5	53
Totals	15,611,023	17	607	1.1	39

* * * * *

NEW ADDITION TO DENVER FILM LIBRARY

"Chemical Booby Traps" is a motion picture that would be an asset in any safety education program. With actual demonstrations, the film shows potential hazards in storage of chemicals, use of laboratory equipment, and handling of chemicals. It will be valuable for orienting new laboratory employees or reminding experienced personnel of everyday principles of safety.

Requests for loan of this 10-minute, 16-mm color-sound film for project showing should be addressed to the Chief Engineer's Office, Attention: D-841.

* * * * *

RECLAMATION BEGINS PROGRAM OF NOISE ABATEMENT FOR EMPLOYEES

The Bureau of Reclamation has begun a survey and evaluation program aimed at protecting its employees against injurious noise levels, the Department of the Interior announced today.

"Bureau operations themselves do not represent a serious noise level problem to our personnel," explained Commissioner of Reclamation Floyd E. Dominy, "However, we intend to survey all operations within and related to our program, where excessively high noise levels could present a problem, and take appropriate steps to protect the hearing of Bureau employees."

"Each of Reclamation's seven regional offices in the West will be responsible for implementing the program in its respective areas," he added. The agency employs 10,300 persons in the 17 contiguous Western States.

Commissioner Dominy said the initial survey will cover the Bureau's 49 powerplants and 96 major pumping plants. Special attention will be given to these elements of the Bureau's program: operation of mechanical and hydraulic machinery, structural and architectural work, operation of laboratories and machine shops, and maintenance and construction work. Dominy indicated that special studies had been made in selected areas and acoustical treatment for noise reduction installed where plant operators spend most of their time. The new study will also contribute to the knowledge of the effectiveness of design criteria previously established to reduce noise levels.

"The program is being undertaken," Commissioner Dominy said, "because with the exception of local ordinances, there exist no uniform noise level standards in the United States." Where noise levels are found to be potentially injurious to operation and maintenance personnel, the cause will either be eliminated by design changes or the employees will be provided with protective devices.

* * * * *

SAFETY: MORE THAN DESIGN

The Department of Transportation's recent report on alcohol and highway safety confirms what state highway officials have tried to drive home to state and federal lawmakers for years: Namely, drunken driving is the main cause of road accidents.

The report says, "More than half of the nation's highway fatalities each year involve drivers or pedestrians under the influence of alcohol."

Highway officials know that road and vehicle improvements reduce road accidents. But they can't do it all. These things can't substitute for human ability to cope with emergency situations. And scientific evidence overwhelmingly proves that alcohol impairs that ability.

Those responsible for highway safety have urgently stressed the need for a three-pronged attack on highway accidents, with education, enforcement and engineering. To date, only engineering seems to have scored any significant advances. Bureau of Public Roads and state highway engineers consciously build safety into the Interstate highway system, and Congress recently pushed the auto industry into building safer cars.

Highway accidents now kill 150 persons, injure 6,000 and cost \$30 million every day. That's too much. We can't afford to go on overlooking the driver's role. We need firm, fair and strict enforcement of safe driving rules.

One western state reports that 68% of the drivers killed in the state had enough alcohol in their blood to impair driving ability seriously. California highway officials claim the proportion there is 50%; Florida officials say 47%.

Unquestionably, Connecticut's lower highway fatality rate (about half the national average) is due at least in part to the state's rigid and effective highway safety enforcement program. And Britain's controversial chemical screening tests, with subsequent stern punishment for offenders, already are credited with sharply reducing road accidents and fatalities. So, too, Denmark and Sweden.

Constructive action against the real culprit in highway accidents is long overdue, and Congress now has both the motivation and the means for forcing states to act. The report, ordered by an act of Congress in 1966, provides ample motivation. The same financial power that backs up federal insistence on safe design by the states provides the means.

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* * * * *

SAFETY AWARDS

CONSTRUCTION SAFETY AWARD



The Bureau of Reclamation's Construction Safety Award was recently presented to Mr. R. F. Calou (above, right), Vice President of the Fredrickson & Watson Construction Company, by Mr. William C. Hart, Acting Project Construction Engineer, Willows, California. The award was given in recognition of the outstanding safety record maintained during the 2-year construction of Reach 2 of the Tehama-Colusa Canal (under Specifications No. DC-6290) by the joint venture of Fredrickson & Watson and Lord & Bishop, Inc., of Oakland, California. Photo PX-D-62395



The Construction Safety Award was presented to Gunther and Shirley Company and E. V. Lane Corporation in recognition of an exemplary construction safety record. Employees of the joint venture worked 268,537 man-hours without a lost-time accident from January 1965 to April 1968 during completion of the San Luis Pumping-Generating Plant under Specifications No. DC-6185. Shown above are, left to right: Robert Cary, Regional Safety Officer, Region 2; Max Johnson, Project Construction Engineer, Los Banos, California; Joseph Shirley, Vice President of Gunther and Shirley; R. J. DeVault, Vice President of E. V. Lane; and Herman Gunther of Gunther and Shirley Company. Bureau of Reclamation Photo P805-236-14496 NA.



Mr. Dean Studer, center, of R. J. Studer and Sons, accepts the Construction Safety Award from G. R. Hanson, Chief, Engineering Division, Great Falls, Montana. Regional Safety Engineer, L. M. Hayes, left, looks on. The award was earned by R. J. Studer & Sons for completing contracts for lining work on the Helena Valley and East Bench Canals without a single disabling injury. Bureau of Reclamation Photo PX-600-31 NA

NATIONAL SAFETY COUNCIL SAFE DRIVER AWARDS

Stampede Dam, Washoe Project, Nevada-California. Pictured below is the safe driving award presentation for Stampede Dam construction personnel. Project Construction Engineer Jack Carter is presenting a 10-year Safe Driving Award to Inspector Floyd Brown. Other safe driving award recipients shown, from left to right, are: Messrs. Zupanic, McConnell, Robison, Phillips, Gager, Larrouy, Baum, Crawford, Smith, Poteet, Strawlow, Enlow, VanderWerf, Miller, and Heintz. Photo P949-235-285 NA



FROM THE FIELD

Auburn-Folsom South Unit CVP Construction Office, California - Bureau of Mines Instruction Course in First-Aid Methods. Classes were held in the evenings on a volunteer basis for employees and employees' wives. George A. Ettles, Construction Inspector, conducted the course and was assisted by Roscoe Bell, Civil Engineering Technician (Surveys), and E. C. Rodriguez, Jr., Safety Engineer. Howard E. Poland, Subdistrict Manager for the Bureau of Mines in Oakland, California, examined the class.



Seated, left to right: Bertha Manning, Diana Jane Damgaard, Susan M. Hermance, Vivian M. Gilbert, Beverly Ann Carter, Diana M. Hines, Lacy M. Price. Standing, left to right: John Hermance, E. Rodriguez, Jr., Edward O. Lintz, Robert S. Heisleman, Howard E. Poland, George A. Ettles, and John G. Livingston. Photo PX-D-62394

North Platte River Projects, Casper, Wyoming - Seminole Plant Employees Worked 5,000 Days Without Lost-time Injury. It was announced by R. M. Sensintaffar, Project Manager, Casper, that on September 5, 1968, Bureau of Reclamation employees stationed at Seminole Dam completed working 5,000 days without a lost-time injury. This period represents an accident-free record of 13 years, 8 months, and 15 days. To celebrate the occasion, James Ingles, Regional Director, Region 7, visited Seminole Dam on September 24, 1968, to award the employees with a trophy for their excellent safety performance. This safety record is the longest of any operating group within Region 7.

Pictured below at the conclusion of the ceremony are Seminole employees (seated) Chuck Bundy, Gene Bashor, Ray Haygood, John Thalken, George Vance (holding citation), Al Degn, Foreman Ernie Specht (holding trophy), Jerry Tyler, George Race, Glenn Stringham, Bill Kramp and Powerplant Superintendent Bud Carpenter from Alcova. Standing are Charles Saunders, Project Safety Officer; Harry Caperton, Region 7 Supervisor of Power, Ralph Asbridge, Chief, Power Division, Casper; Jim Ingles, Regional Director; Bob Sensintaffar, Project Manager; Ab Watts, Region 7 Chief of Power O&M, and Stan Stolt, Project Chief of O&M. Photo P144-703-4093 NA



Region 2, Sacramento, California - Bureau Frogman Activities. Thomas E. Morris, pictured below, is the Underwater Inspection Specialist and Manager for Reclamation's Region 2 Underwater Examination Program. Morris, a diver of 23 years, was instrumental in establishing the Bureau's highly successful engineer-frogman concept of underwater inspections in 1964-65. Photo PX-D-62393



Mr. Morris was recently singled out by the Brooks Institute of Photography, Santa Barbara, California, as the top student in the Institute's 1968 underwater photography class. The recognition thus accorded is a demonstration of the skill and proficiency of the Region's Underwater Inspection Team in general and that of Morris in particular. Morris recognized the importance of photographic records of findings of the Bureau's Region 2 SCUBA diving team and initiated color as well as black and white photography of the team's findings.

Members of Region 2's Underwater Inspection Team are shown at work on the opposite page. The top photograph shows them emerging from examination of Nimbus Dam spillway stilling pool. Left to right are: Brent Carter, Jim Andrews, Harold Meyer, Tom Morris, Perry Francis, Galen Fuller and Tom Spicher.



Preparing to dive through ice to examine Gerber Dam outlet works. Left to right: Brent Carter, Jim Andrews, Tom Spicher, Galen Fuller and Tom Morris. Top photo PX-D-62392, bottom photo PX-D-200-1456 NA

Phoenix Development Office, Phoenix, Arizona - Safety Training in Action.



Wesley E. Kleinworth is demonstrating the proper procedure in use of an air-pack rescue unit to his fellow draftsmen in the Phoenix Development Office. Mangolia E. Hogan (right), Supervisor of Drafting, requested that all employees of this group be trained in the proper use of the safety equipment. Also shown are Helen J. Hill and Frank Felix. Training was conducted by Safety Officer Curtis B. McGee. Photo PX-D-62391

The Ozalid printing machine shown in the background utilizes anhydrous ammonia, a highly toxic but readily detectable gas in the event of source leakage or rupture. The air-pack unit provides a 20-minute oxygen supply in conjunction with a sealed breathing mask. The use of this equipment permits a trained employee to operate all shut-off valves with safety, as well as to monitor personnel evacuation.

Curecanti Unit CRSP, Montrose, Colorado - Heavy Equipment. Paragraph 9.4.14 of Construction Safety Standards states, "Tag lines for controlling loads shall be used wherever practicable. Why such precautions after completing performance test required under Paragraph 9.4.2? Because operators do make mistakes and do collapse booms while lifting loads well within the capacity rating of the crane. When it happens as it did on this construction site (see photograph below), personnel are in the clear and no injury results. Photo P860-427-621 NA.



* * * * *

NATIONAL SAFETY COUNCIL DATA SHEETS

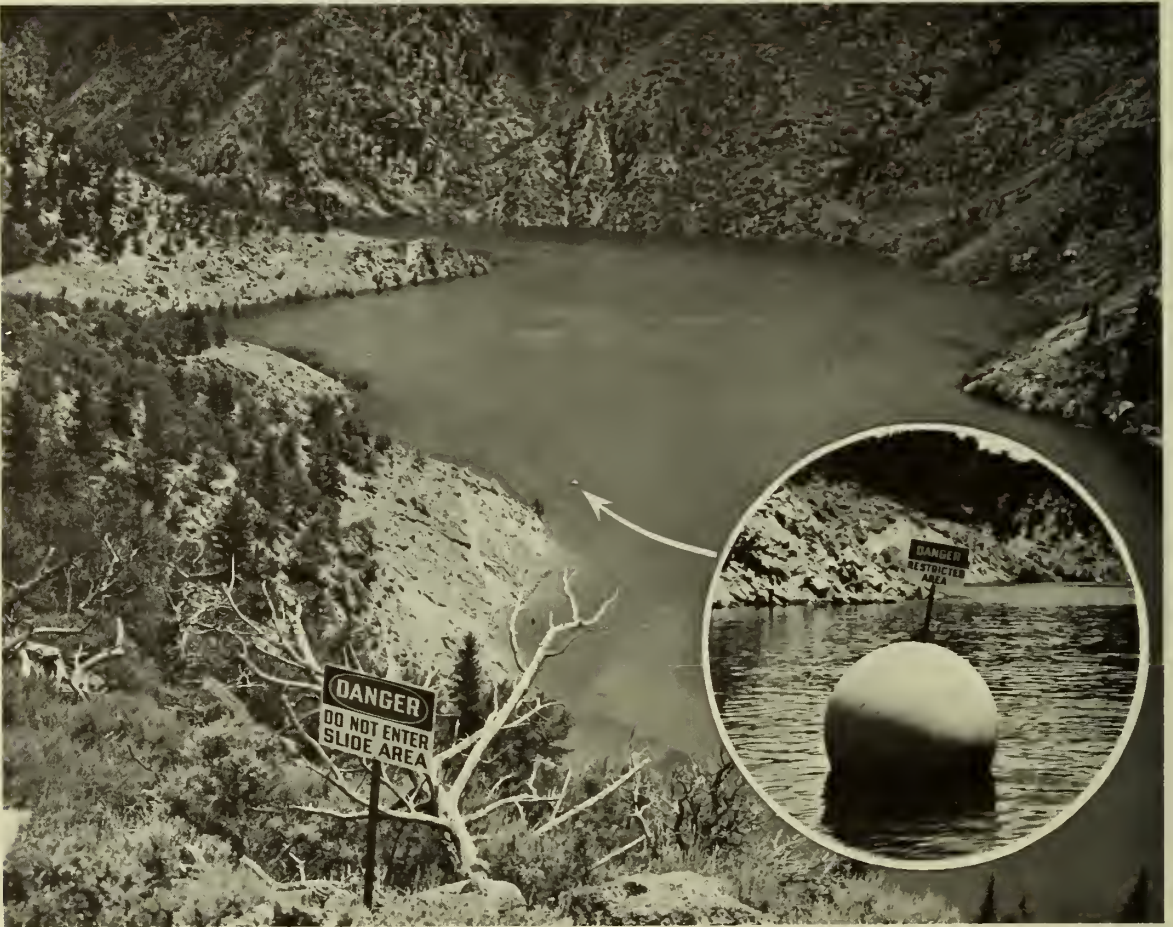
The National Safety Council has recently published new or revised technical data sheets on the subjects listed below. Copies of these data sheets (by the numbers shown in parentheses) may be obtained from the National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611.

Hand Soldering and Brazing (445 Revision A)
Chemical Safety References (486 Revision A)
Tilting-Arbor and Tilting-Table Saws (605)
Fixed Ladders and Climbing Devices (606)
Handling and Storage of Solid Sulfur (612).

* * * * *

WATER SAFETY

Curecanti Unit CRSP, Montrose, Colorado. The photograph below was taken at Morrow Point Dam. View is looking down the canyon wall to the reservoir in the vicinity of a slide area showing a typical sign erected to restrict the public. Note part of the slide area and two of the buoys with warning signs for boats near center of photo. Photo P622B-427-8700 NA



RECORD OF PUBLIC DROWNINGS

January 1, 1968, through September 30, 1968

Bureau-operated Facilities:

Canals	19
Reservoirs	<u>4</u>
Total	23

Facilities Operated by Others:

Irrigation and Water Districts	8
State or County (Recreational)	<u>47</u>
Total	55

Summary of Total Drowings During Period:

By Operating Agency:

Bureau of Reclamation	23
Irrigation and Water Districts	8
State or County (Recreational)	<u>47</u>
Total	78

By Type of Facility:

Canals	27
Reservoirs	<u>51</u>
Total	78

By Activity:

Swimming	26
Boating	16
Fishing	2
Fell into water	21
Other	<u>13</u>
Total	78

By Age:

Under 12 years of age	18
From 12 to 25	33
From 25 to 50	18
Over 50 years of age	<u>9</u>
Total	78

* * * * *

CONSTRUCTION, USE AND MAINTENANCE OF REFUELING EQUIPMENT

Reproduced from "Construction Safety
Release" with permission of the
National Safety Council

A survey made recently of the 50 states indicates that few of the jurisdictions queried have a code specific to the construction, maintenance and use of refueling equipment.

It is almost universal that each state requires contractors to comply with the basic rules for refueling equipment, i.e. shut off motors before refueling, make sure that the nozzle of the dispensing unit makes contact with the filler cap, and instruct employees not to smoke within a specified distance. Others, like North and South Dakota, Ohio and Maryland have adopted the more extensive NFPA code (No. 385), "Flammable and Combustible Liquid Tank Vehicles, 1966." Florida and Wisconsin expand on the basic rules through Administrative or Fire Marshal's Codes on tanks hauling flammable liquids.

The following DO's DONT's appear to be significant in the Construction, Use and Maintenance of Refueling Equipment:

DO

Use ALL possible care to prevent running fuel tank over. Should gasoline be spilled, be sure that no fuel is on the equipment before restarting.

Fill the tank from the windward side whenever possible to prevent excessive burns in the event of ignition.

Allow a sufficient vapor space in the fuel drum or tank to permit expansion of the liquid with changing temperatures. Gasoline expands at the rate of one per cent for each 14 degrees F. rise in temperature.

Equip motors having sparking contacts with explosion proof enclosures.

Install adequate hold down devices to anchor each drum or tank in a suitable manner to prevent movement. Turnbuckles, tie rods and eye bolt connections or similar positive action devices for drawing the tank or drum down tight on the truck bed are recommended.

Mark each side and rear of the refueling truck with the words "Flammable - NO Smoking" in letters at least three inches high. Each container should be marked as to its contents.

Equip each vehicle with at least one suitable size extinguisher having a C rating.

Take precautions to prevent ignition in locations where flammable vapors are present. Sources of ignition may include open flames, smoking, cutting and welding and hot surfaces.

DO

Require that the driver or attendant of any refueling equipment remain in the immediate vicinity of the unit while it is being filled.

Keep body clear of all moving parts. Compressors and other equipment with exposed drive belts, fly wheels, etc. should be guarded.

Keep the bed of the refueling truck clear of all obstructions (good housekeeping) so that personnel using the servicing equipment will not be subject to the hazards of tripping, stumbling and falling.

Make sure that all compressors conform to the ASME standards.

Ground each hose reel base to the metal frame of the vehicle if reels are installed on a wood platform.

Provide adequate ventilation in those rigs of the enclosed type.

DON'T

DON'T Allow smoking by vehicle drivers or other personnel when making deliveries and when filling or making repairs to refueling equipment.

DON'T Use refueling equipment if it's in need of repair or if there is an excess accumulation of grease, oil or other flammables on the equipment.

DON'T Store small quantities of flammable liquids in other than approved type safety containers with flame arrestors.

DON'T Expose the exhaust system of the refueling rig, including the muffler, to leakage, spillage or accumulations of grease, oil or gasoline.

DON'T Install fuel lines made of materials that are adversely affected by the fuels, or of insufficient strength and design for their purpose. All lines should be well secured to avoid chafing or undue vibrations, having a readily accessible and reliable shutoff, stopcock, or self-closing valve.

DON'T Permit employees to continue working when their clothes become contaminated with flammable liquids.

DON'T Make it difficult for personnel to get on and off the rig due to the absence of hand holds, steps or ladders.

--Charles R. Nelson
Warren Brothers Company

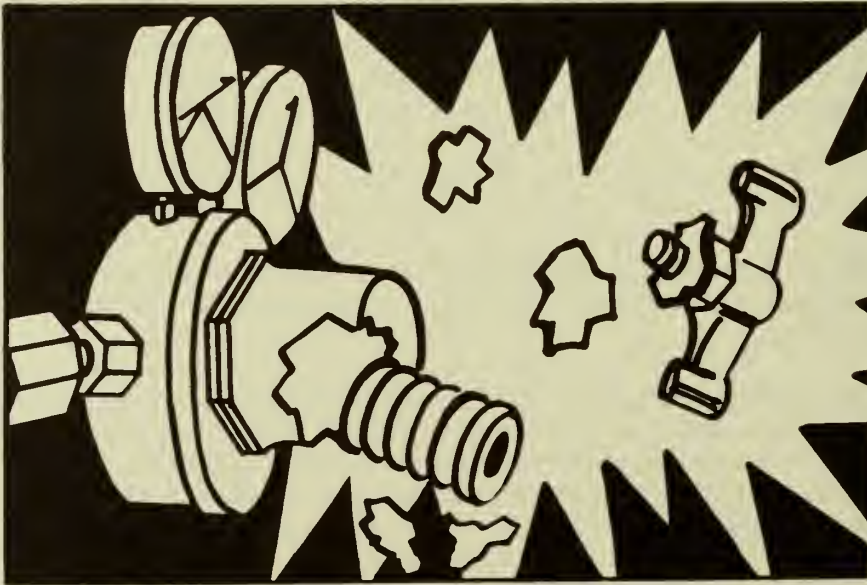
Pertinent safety requirements contained in Reclamation's Construction Safety Standards are as follows:

9.2.6 Fueling Equipment. Internal combustion engine-driven equipment shall not be fueled with the engine running. No smoking shall be permitted at or near the fuel storage area or near equipment being refueled. The following sign shall be posted at fuel storage and fueling areas: "NO SMOKING WITHIN 50 FEET." A dry chemical or carbon dioxide fire extinguisher rated 10 pounds or larger shall be installed at each fuel storage area and on fuel trucks and service trucks.

12.8.20 Self-closing Valves. Dispensing hose and outlets from storage tanks above ground shall be equipped with self-closing valves.

* * * * *

Check Valves



There are usually two explanations for an explosion of a cylinder regulator valve.

1. The user, in removing the cylinder valve protection cap, has deposited a smear of oil or grease on the valve.

2. The hose line has not been bled by the previous user. The situation becomes dangerous when the oxygen comes into contact with grease, oil, or acetylene within the hoses, piping, or regulators. If acetylene enters the low pressure side of the oxygen reduction valve, the high pressure stream of oxygen mixed with the acetylene can result in a violent explosion and fire.

If the oxygen comes in contact with oil, grease, or a combustible, there can be combustion with explosive violence. If the oxygen cylinder is unchained, the explosion will result in the cylinder turning into a rocket with the thrust of escaping gas from a destroyed regulator.

Safety checks:

1. Be sure there is no oil or grease on hands or gloves when changing cylinders.
2. Fasten the oxygen cylinder so it cannot fall - then remove the valve protection cap and install the regulator.
3. When stopping or interrupting work for a prolonged period, close the cylinder valve, bleed the hose lines, back off the regulator pressure adjustment screw, and close off the oxygen and acetylene valves on the torch.

* * * * *

ROLLOVER PROTECTIVE SYSTEMS PROVE VALUABLE

The following abstract report of a recent accident dramatically points up the benefits of the required rollover protection and seat belts:

PLACE: Road relocation, Stockton Dam and Reservoir, Stockton, Missouri, U.S. Army Corps of Engineers' contract

EQUIPMENT: TS-24 Euclid, Twin Engine Motor Scraper equipped with R.O.P.S. and seat belts

DETAILS OF OCCURRENCE: A scraper had been loaded in a borrow area and was on its way to a fill on a road relocation project. Without the scraper operator's knowledge, the exit haul road has been watered down prior to his leaving the borrow area. As the scraper was rounding a slow curve in the road (approximately 15 m. p. h.) it started to slide; as the operator was making correction for his slide, the scraper hit a dry spot in the road. This combination of events caused the scraper to flip over, landing with all four wheels in the air. The scraper was equipped with rollover protection and the operator had his seat belt secured at the time of the accident. Consequently, no medical attention was required. Damage to the equipment consisted of a bent exhaust pipe and air breather. The scraper was back in operation within 4 hours after the accident.

NATURE AND NUMBER OF INJURIES: None.

(Extracted from Report of Accident, U.S. Army Engineer District, Kansas City, Corps of Engineers, Kansas City, Missouri.)

REMARKS BY HOWARD S. LATHAM, CHIEF SAFETY ENGINEER
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
AT THE NATIONAL SAFETY CONGRESS, MINING SECTION
OCTOBER 31, 1968, CHICAGO, ILLINOIS

ROLLOVER PROTECTIVE SYSTEMS FOR
HEAVY-DUTY OFF-HIGHWAY EARTHMOVING EQUIPMENT

The major responsibility of the Bureau of Reclamation is developing water resources for more than half of our nation. As a Federal agency and the contracting officer for the Government, it must provide for the health and safety of the people who perform its work -- both its own and contractor employees. In addition to the legal and moral inducements to undertake this humanitarian responsibility, there are compelling economic considerations. The owner -- in our case the Federal Government -- must bear the increased costs which result from a poor accident record and which are reflected in higher bids. Also, since the enactment of the Federal Tort Claims Act, we have been made painfully aware of the financial penalties resulting from neglect or failure to face up to this responsibility. As a result, we have an obligation, as well as a very tangible incentive, to actively participate with the contractors in an effort to reduce accidents and to improve the safety record in the construction industry.

As a responsible contracting agency, we have attempted to meet this obligation by incorporating safety standards in our contract specifications. Construction of dams, canals, pipelines and tunnels -- involving extensive use of off-highway earthmoving equipment -- comprises an estimated 75 percent of a current 250 million dollar construction program. We are proud of the fact that over 99 percent of this construction is done by private contractors on a competitive bid basis -- also that approximately 90 percent of our project costs are repaid to the Federal Government, most with interest.

In reviewing the fatal accidents which our contractors have experienced during a 3-year period, we found that 20 of the 24 fatalities -- over 80 percent -- resulted from the operation of construction equipment. At least four of the deaths resulted from equipment upset or rollover. Consequently, in revising our construction safety standards, considerable attention was devoted to equipment operation.

The equipment section of the current edition of Reclamation's Construction Safety Standards, published June 1, 1968, provides for the installation of rollover protection and emergency braking systems on high-speed off-highway earthmoving equipment, specifically scrapers and trucks. Roll bars are required on farm-type tractors, and seat belts are required on all machines equipped with rollover protective systems. Self-propelled crawler-type tractors, loaders, and similar

machines are required to be equipped with heavy-duty protective canopies meeting specific design standards. While our current specifications do not require the installation of rollover protective systems on pneumatic-tired loaders, we are considering adding this requirement.

Possibly the most useful contribution I can make in this discussion is to explain the basis for our decision to require rollover protection on earthmoving equipment -- particularly in face of the controversy that existed -- and still exists -- with respect to this safety measure. To my knowledge, the Bureau of Reclamation together with the California Division of Industrial Safety and the Corps of Engineers shares the questionable distinction of initiating the requirement for rollover protection. Since we dealt ourselves a hand only recently -- after re-searching the matter for over a year -- we hopefully may have avoided many of the birth pains suffered by the Corps and the State of California.

While the opinion is not shared by everyone, there was never any question in our mind of the need for rollover protection, particularly on high-speed earthmoving equipment, such as scrapers and haul trucks. This conviction was based on our experience, and the experience prevalent throughout the construction industry, since it was evident that equipment rollovers and upsets were not an uncommon occurrence. Unfortunately, unless the "law of gravity" is repealed, rollovers will continue to occur. Also -- and regrettably so -- there was ample evidence that operators had suffered serious injury and death and that equipment had been extensively damaged as a result of rollovers. While the cause of rollovers is an important safety consideration, it was not -- and is not -- pertinent to the consideration of the need for rollover protection.

Regardless of whether the rollovers were caused by operator error, mechanical failure, or poor haul roads, the indisputable fact was that they did occur. Consequently, we could only conclude that there was a need to protect the operator and the equipment in event of upset or rollover. It should be emphasized that few in the industry, including The Associated General Contractors of America and the Construction Industry Manufacturers' Association, took issue with the need for the protection -- providing that it was practical. As further evidence of the need, some safety minded contractors were installing protective canopies and rollover protection on their machines -- on their own initiative. Significantly, subsequent reports of lives saved, and damage to equipment minimized due to the installation of rollover protective systems have proven the value of, and the necessity for, the protection.

Having concluded that the need existed, the problem resolved itself essentially to consideration of application, practicability, availability, and cost. From the beginning it was our hope -- and still is -- that the

equipment manufacturers would design and build the protective systems into their machines as an integral part of the equipment and not as an optional attachment. However, due to cost and design problems -- which are not negligible -- there was a tendency to react negatively: To maintain that the installations were too costly, to procrastinate until contractors or others forced the issue, or to delay until the Society of Automotive Engineers or the Construction Industry Manufacturers' Association published design and performance standards. While there may have been some justification for this stand, it did not get the job done -- nor did it advance the cause of safety in an industry beset with criticism of its poor accident record: An industry that could not continue to procrastinate nor afford to consider safety as an option.

In determining what type of machines should be equipped with rollover protective systems, we considered both current need and practicability -- specifically as related to the nature of our construction operations. Contractor accident experience, coupled with consideration of equipment characteristics, indicated that rollover protection was critically needed on high-speed pneumatic-tired motor scrapers and dump trucks of 14 cubic yards capacity or greater. Incidentally, today earthmoving machines of this description comprise most of the high-speed earthmoving equipment in use on our jobs. These machines are designed and powered to move material fast and efficiently -- haul large payloads and to maneuver speedily and effortlessly -- all desirable. However, the consequences of an operator error or equipment failure increases proportionately with weight and speed of the machine. High-speed rigs, equipped with hydraulic steering and braking systems, proved particularly susceptible to loss of control -- resulting from either equipment failure or operator error.

In considering practicability, it was realized at the outset that the frames on many of the older models of motor scrapers and trucks simply would not support a rollover system capable of withstanding rollover stresses. As a result, our requirement for installation of rollover protection on scrapers and trucks applies only to machines of this type manufactured after 1965. As a concession to comfort -- or environmental health, if you prefer -- and to enable manufacturers to resolve the design problem, we excluded motor scrapers and trucks manufactured prior to January 1, 1970, which are equipped with weather cabs. However, all subsequent models will be required to meet the requirement. Hopefully, by then the manufacturers will have taken the initiative and built the protection into their weather cabs -- either as standard or optional equipment.

As the Construction Industry Manufacturers Association and the Society of Automotive Engineers, we experienced difficulty in determining an acceptable minimum design or performance criteria for rollover protection systems. While we preferred to adopt the J320 "Minimum

Performance Criteria for Roll-over Protective System for Rubber-tired, Self-propelled Scrapers," recommended by the Society of Automotive Engineers, it was found to be impractical, particularly for larger equipment. The SAE standard is presently being revised and, hopefully, will be acceptable for adoption as an industry-wide standard. We finally settled on a rollover protective system designed to support not less than two times the weight of the prime mover applied horizontally at right angles to the median plane of the prime mover; and the weight of the prime mover applied separately in a vertical direction to each side of the top of the rollover system. This criteria is similar to that required by both the State of California and the Corps of Engineers and is proving effective in protecting the operator and equipment in event of rollover or upset. However, as I've indicated, we would prefer a design or performance standard developed by the Society of Automotive Engineers, who represent the equipment designers and manufacturers. Only in this manner can we achieve industry-wide uniformity and acceptance of the standard.

We considered both availability and cost prior to incorporating the requirement for rollover protection in our revised Construction Safety Standards. While rollbars and rollover protective systems were not available from equipment manufacturers -- and still are not -- several steel fabricating companies in the west had been manufacturing protective canopies for many years. Following enactment of the State of California safety order requiring rollover protection, other firms entered the field. At the present time, as shown on Exhibit A, which is attached to the copies of my remarks, we know of at least 20 companies who manufacture protective canopies and rollover protective systems which meet the design and performance criteria of the State of California and the Bureau of Reclamation.

Rollover systems engineered and designed for installation on practically every current model and type of earthmoving machine -- including dozers, loaders, scrapers, graders, prime movers, farm and industrial tractors -- are now available. The systems I've seen are well engineered, practical, attractive in appearance, and certified to meet or surpass prevailing safety specifications. Today a contractor can also obtain structural, all-weather, cab-style rollover protective systems for most of his earthmoving equipment.

The cost of rollover protective systems, including field installation, averages less than 1-1/2 percent of the initial cost of the equipment -- or less than the sales tax. For example, you can equip a \$90,000 dozer with a protective canopy for around \$1,100. A 30-cubic-yard self-propelled scraper which cost \$115,000 can be equipped with a rollover protective system for as little as \$1,300. For a cost of between \$600 and \$800, you can install a job-tested protective system on a \$60,000 five-cubic-yard rubber-tired loader. Dollarwise, considering the cost of job-connected injuries, equipment repair bills, and the loss of production, rollover protection would appear to be a good investment.

Attached to my remarks as Exhibit B you will find a comparison of the current specifications for rollover protective systems required by the State of California, the Corps of Engineers, and the Bureau of Reclamation. The principal difference between our specifications and those of the Corps of Engineers is that we permit the installation of heavy-duty protective canopies in lieu of rollover protective systems on rubber-tired loaders and track equipment. Also, due to the design characteristics of older equipment, and at the recommendation of the Society of Automotive Engineers, we do not require rollover protection on motor scrapers and prime movers manufactured prior to 1966. Scrapers and prime movers equipped with weather cabs and manufactured prior to January 1, 1970, are also exempted under Reclamation specifications. As discussed, this exclusion was considered appropriate in order to permit the manufacturers of the machines and protective systems to resolve the problems associated with building the protection into the cab design.

Considered in retrospect, we believe our decision to exclude dozers and similar track equipment from the requirement was essentially sound. This conclusion is based upon our accident experience, the operating characteristics of these machines, and is buttressed by the strong objection of many dozer operators to being "belted in" -- particularly when working on pioneer roads, dam abutments, and steep slopes.

On the other hand, we are now definitely of the opinion that rubber-tired loaders should be equipped with rollover protective systems. This change of opinion was brought about due to the subtle changes which have taken place in both the design and utilization of loaders. Not too long ago, loaders handled relatively small loads over short distances on comparatively level terrain and at low speed. As the name implies, they were used as material loaders and the primary safety consideration was to protect the operator from falling material.

Today the picture has changed, and with it the safety considerations. Rubber-tired loaders are now designed and powered to move large loads -- 10 yards and over is now commonplace -- at greater speeds over longer distances. On more and more jobs they are being used as prime movers traveling over haul roads and up and down grades. These changes in design and utilization, together with the fact that loaders are inherently less stable than conventional prime movers, increases the possibility of rollover and upset. As a result, we are convinced of the need to equip current models of rubber-tired loaders with rollover protective systems.

In order to place the Bureau of Reclamation's involvement in its proper perspective, I should explain that we consider our efforts to

date largely as an interim measure to get the ball rolling. It was not our intent to establish or to dictate performance and design standards for construction equipment. Such responsibility properly belongs in the hands of the contractors and the equipment manufacturers. The action taken by Reclamation, the Corps of Engineers, and the State of California simply filled a void. We, along with many others, recognized the need for a protective system which would make allowances for operator error, equipment failure, and protect the operator from serious injury or death.

Consequently, we would be the first to admit that our efforts were merely a beginning and the eventual success or failure of the program lies with the contractors and manufacturers. It is our hope that the industry will pick up the ball and utilize the technical know-how of its engineers and the talent of its manufacturers in the development of test criteria and performance standards for rollover protective systems. These standards, promulgated by the industry and published by the Society of Automotive Engineers and the United States of America Standards Institute, will provide a uniform standard for industry-wide application -- including use by regulatory agencies. In this manner the industry will be assured of performance standards and test criteria established on a sound technical basis with consideration for the practical limitations associated with the design, manufacture, and operation of the equipment.

The need for rollover protection today is as great -- if not greater -- as the need for hard hats was 25 years ago. You can advance the cause of safety in the construction industry today by demanding the safe look -- **HARD HATS FOR EARTH MOVERS.**

MANUFACTURERS OF PROTECTIVE CANOPIES AND
ROLLOVER PROTECTIVE SYSTEMS FOR EARTHMOVING EQUIPMENT

<u>Manufacturer</u>	<u>*Product</u>
Automatic Rebuilders & Sales Company 4991 Eastside Road Redding, California	Canopies for crawler tractors
Berglund Tractor and Equipment Company Napa, California	Canopies for crawler tractors Canopies for loaders
Brizard-Matthews Machinery Company P. O. Box 77 Eureka, California	Canopies for crawler tractors
Buran Equipment Company 1366 Doolittle Drive San Leandro, California 94577	R.O.P.S. for scrapers Canopies for loaders
Clark Equipment Company Construction Machinery Division Benton Harbor, Michigan 49022	R.O.P.S. for scrapers Canopies for loaders
Drain Machinery & Supply Company Drain, Oregon	Canopies for crawler tractors
R. T. Gabco Manufacturing Company 2000 E. Columbia Way Vancouver, Washington 98661	Canopies for loaders
W. E. Gabriel Fabrication Company 1627 N.W. 14th Avenue Portland, Oregon 97209	R.O.P.S. for scrapers Canopies for crawler tractors
H&R Metal Machine Company, Inc. 1474 Santa Rosa Avenue Santa Rosa, California	Canopies for crawler tractors Canopies for loaders
Industrial Engineering Company P. O. Box 394 Eureka, California	Canopies for crawler tractors
Industrial Welding Services Brunswick Road and Highway 20 Grass Valley, California 95945	R.O.P.S. for scrapers

*Product listed approved by the State of California, Division of Industrial Safety.

Intercontinental Engineering and
Manufacturing Corporation
P. O. Box 9055
Kansas City, Missouri 64151

R.O.P.S. for scrapers

Medford Steel and Blowpipe Division
Concrete Steel Corporation
1119 Court Street
Medford, Oregon 97501

Canopies for crawler tractors
R.O.P.S. for scrapers
Canopies for loaders

Mixermobile Manufacturers, Inc.
8027 N.E. Killingsworth Street
Portland, Oregon 97220

Canopies for loaders

SAF-T-CAB, Inc.
919 Garden Highway
Yuba City, California 95991

Canopies for crawler tractors
R.O.P.S. for prime movers
R.O.P.S. for scrapers

Sellby's Machine & Welding Works
1043 State Street
Redding, California

Canopies for crawler tractors

Southwest Welding and Manufacturing
Company
3201 West Mission Road
Alhambra, California 91803

R.O.P.S. for scrapers

Tenco Tractor
8780 Fruitridge Road
Sacramento, California 95826

R.O.P.S. for scrapers

Tube-Lok Products
Division of Portland Wire & Iron
4706 S.E. 18th Avenue
Portland, Oregon 97202

Canopies for crawler tractors
R.O.P.S. for scrapers
Canopies for scrapers

Wagner Tractor, Inc.
P. O. Box 7444
Portland, Oregon 97207

Canopies for loaders

Note: The companies listed manufacture protective canopies and rollover protective systems meeting Bureau of Reclamation and State of California, Division of Industrial Safety, specifications. In addition to manufacturing canopies for track equipment and rubber-tired loaders, some of the companies listed also manufacture rollover protective systems (R.O.P.S.) for this type of equipment.

Current approval lists may be obtained from the State of California, Division of Industrial Safety, P. O. Box 603, San Francisco, California 94101.

CURRENT SPECIFICATIONS FOR *R.O.P.S. AND PROTECTIVE CANOPIES

BUREAU OF RECLAMATION1/

CORPS OF ENGINEERS2/

STATE OF CALIFORNIA

Rubber-Tired Scrapers and Dump Trucks:

R.O.P.S. designed to support not less than 2 times the weight of the prime mover applied horizontally at right angles to the median plane of the prime mover and the weight of the prime mover applied separately in a vertical direction to each side of the rollover protective system.

Requirement applies to motor scrapers and dump trucks with a struck capacity of 14 cu yd or greater manufactured after 1965.

Exclusions: Dump trucks with heavy-duty canopies. Motor scrapers manufactured prior to 1-1-70 equipped with weather cabs.

Seat belts: Required.

R.O.P.S. designed to support 2 times the weight of the prime mover, based on the ultimate strength of the metal and integrated loading of supporting members applied at the point of impact.

Required on all crawlers and rubber-tired earthmovers, self-propelled pneumatic-tired earthmovers, water tank trucks and similar off-highway earthmoving equipment, including front-end loaders.

Exclusions: No exclusions based on size or model of equipment. Some Corps Districts exempt dump trucks manufactured with heavy-duty canopies.

Seat belts: Required.

R.O.P.S. designed to withstand impact of rollover. Design specifications require specific approval of the Division of Industrial Safety, State of California. (Minimum design criteria is based on 2 times the weight of the prime mover applied vertically, plus 1/3 the weight applied horizontally and simultaneously.)

Requirement applies to motor scrapers and dump trucks with a struck capacity of 15 cu yd or greater.

Exclusions: Dump trucks with heavy-duty canopies.

Seat belts: Required.

*R.O.P.S. - Rollover Protective Systems.

Crawler-Type Equipment (Dozers, Tractors and Loaders):

Protective canopies meeting specific design criteria based upon weight of the equipment.

R.O.P.S. as specified above.

Exclusions: None.

Protective canopies meeting specific design criteria based upon weight of the equipment. (Similar to Reclamation specifications.)

Exclusions: None.

Seat belts: Required.

Exclusions: Equipment operating in areas where there is no hazard from falling or rolling objects.

Seat belts: Not required.

Seat belts: Not required.

Rubber-Tired Front-End Loaders:

Protective canopy or cab of sufficient strength to withstand the impact of falling material.

R.O.P.S. as specified above.

Exclusions: None.

R.O.P.S. as specified under scrapers above.

Exclusions: Loaders of less than 1-1/2 cu yd capacity. Loaders operating on flat ground.

Exclusions: Loaders of less than 1-1/2 cu yd capacity.

Seat belts: Required.

Seat belts: Not required.

Seat belts: Required.

Note: Reclamation specifications are being revised to require R.O.P.S. and seat belts on front-end loaders.

NOTES:

1/ The Bureau of Reclamation will accept R.O.P.S. meeting design or performance specifications approved by the Corps of Engineers, State of California, or Society of Automotive Engineers Construction and Industrial Machinery Technical Committee. Protective canopies for crawler equipment approved by the State of California are also acceptable.

2/ Corps of Engineers will accept R.O.P.S. approved by the State of California.

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rope

... Have You Hung Up?

Manila, sisal, polyethylene, polypropylene? Plaited, braided? The advent of synthetic materials in rope and various methods of rope fabrication have made the selection of the right rope for the task more complex. Much of construction safety is tied up with rope use — block and tackles, safety nets, etc. Here's what's available.

By **James M. Albright**, communications consultant, Columbian Rope Co., Auburn, N. Y.

BE IT AN ARBORIST pruning a tree, a utility lineman repairing a broken wire during a storm, a group of men climbing Mt. McKinley, or men working on a moveable scaffold, all have one thing in common:

A dependence upon rope to safely complete their tasks.

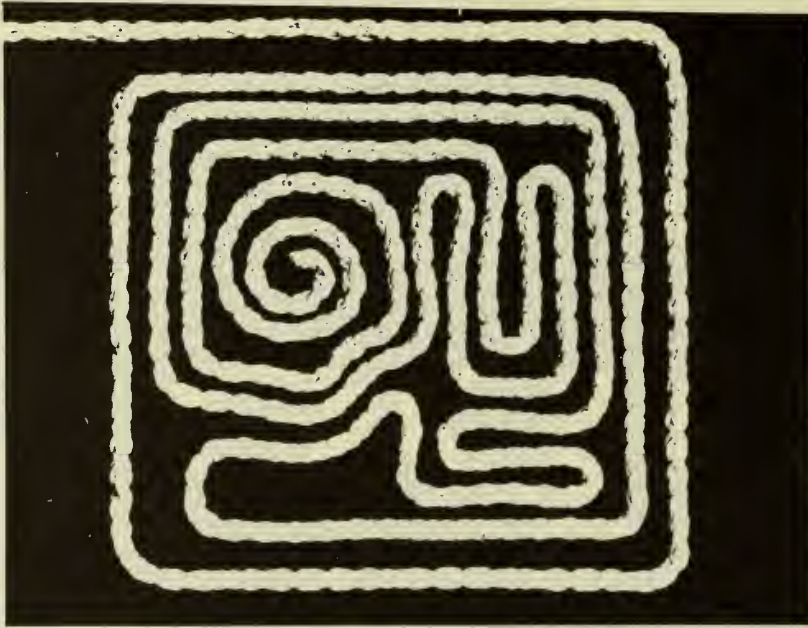
In fact, in most cases where rope is employed, safety is of extreme importance. Therefore, the selection, care, and knowledge of the limitations of the particular type of rope is a must.

For instance, the arborist should be using either rope of polyester, a combination of polyester and polyolefin fibers, or a pure Manila rope, constructed to resist severe surface abrasion; the lineman should be us-

ing a polypropylene rope, treated to resist conduction of electricity when wet; the mountain climbers (or anyone using a lifeline) should be using a specially-twisted, high-strength nylon rope; etc.

Selection of the right rope is not always easy. And yet, rope, when used within limitations of its various structural designs, is an engineering tool that can save lives and enhance property values.

It is the purpose here to give some indication of the types of



Illustrated is a plaited rope, which is constructed so that eight strands are combined in such a way that there are four left-twisted strands intermixed with four right-twisted strands. This construction is designed to neutralize twist.

If exposed to acids, natural fiber ropes, such as Manila, should be scrapped or retired from critical operations, as visual inspection will not always reveal acid damage.

If in doubt about the condition of your rope on visual inspection, open a strand of yarn and take out several lengths of fiber. Stretch this fiber and break it across your thumb nail—do the same with a fiber from new rope and note the difference. If the fiber from the used rope breaks quite easily and feels brittle and dry, the rope should be discarded.

Rope care

The first thing to remember when using rope is not to overload it. Natural fiber rope loaded to over 50 per cent of its tensile strength will be permanently damaged, while synthetics loaded to over 65 per cent may be damaged. Damage of this nature can be detected through inspection of internal fibers as described above.

Actual recommended, working loads for various rope sizes are outlined as a percentage of tensile strength in Table III.

The factors of safety variations among different types of rope are derived from elements such as chafing, cutting, elasticity, diameter-strength ratio, and general mishandling of a line.

In general, the following points

should be remembered:

- Severe unbalancing of twisted rope can cause permanent damage by localized over-twisting, causing kinking or hockling.
- Rope should not be dragged on the ground or against rough or sharp objects.
- Sharp bends over an unyield-surface cause extreme tension on the fibers. To make a rope fast, an object with a smooth round surface of sufficient diameter should be selected. If the object does have sharp corners, pads should be used. Size of suitable sheaves will vary with the size of the rope. For instance, a $\frac{3}{4}$ -inch rope should have a six-inch diameter sheave; a $1\frac{3}{8}$ -inch rope should have an 11-inch diameter sheave.
- Use of wet rope or of rope reinforced with metallic strands near power lines and other electrical equipment is extremely dangerous, unless the rope has been specially treated to reduce the hazard of conduction of electricity. One company has just announced a new treatment for its

polypropylene rope that drastically reduces the possibility of electricity being conducted through the rope after it has become wet.

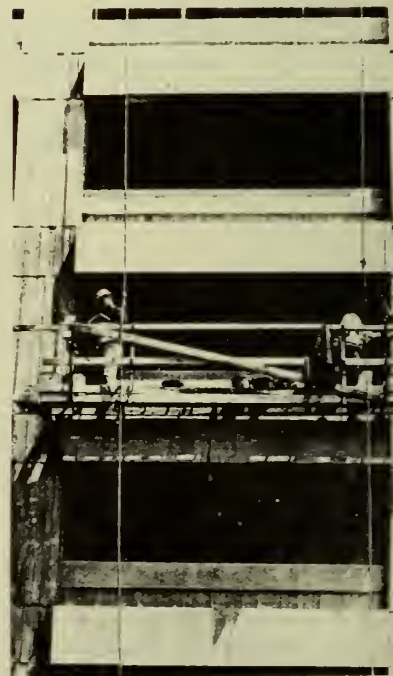
- To maintain the existing strength of any rope, when properly prepared it should be stored safe from deleterious fumes, heat, chemicals, moisture, sunlight, rodents, and other biological attack.

One final point concerning rope safety: When joining ropes, splice rather than knot. A well-made splice will retain up to 95 per cent of the strength of the rope, but a knot will retain only 50 per cent.

Some of the points made in this article will be outlined in Chapter 21 of the sixth edition of the National Safety Council's *Accident Prevention Manual for Industrial Operations*.—End.

ACKNOWLEDGEMENT

Unless otherwise noted, all photographs used to illustrate this article were supplied through the courtesy of Columbian Rope Co.



Manila rope is quite often used for construction scaffolding because of little stretch, strength, and inexpensiveness.

TABLE I

Some Natural Fibers		
Type	Hard Soft	Description
Manila	X	best and strangest; fram abaca (species af banana) plant; chiefly fram Philippines.
Sisal	X	widely used substitute far Manila; fram Agave cactus plant; grown thraughaut warld, mostly in East and West Indies, Africa and Mexica.
Henequen	X	known as "Mexican Sisal"; rough, crude, and in-expensive; used for law grade cardage.
Hemp	X	ance the mast papular; naw used far twine and small cordage; named far area af arigin: American, Russian, Chilean, ar Italian hemp.
Jute	X	far industrial twine and sacking material; a versa-tile fibre from India.
Cotton	X	used chiefly far card; grawn everywhere.

ropes available today, what their strengths and weaknesses are, and to outline the correct procedure for maintaining maximum safety when using rope.

Types of Rope

All fiber ropes can be placed in two broad classifications—natural and synthetic. The natural fiber ropes have been around the longest and the ones that find the most use are Manila and sisal. There are others, however, and some of the main ones are listed in Table I with a brief note concerning their source.

Natural fibers

Natural fibers vary in many ways: tensile strength; resistance to water and abrasion; durability; coarseness; such quality-affecting factors as the part of the plant from which the fiber is taken; soil, climate, and geography of the plant environment; cultivation and preparation; plus construction of the finished rope (which could be three-stranded, four-stranded, eight-stranded, interweaved, etc.).

Manila is the best suited natural fiber for cordage because of its high tensile strength, flexibility, ease of handling, resistance to water and abrasion, and (when specially lubricated) long service life. High-grade

Manila rope, when new, is firm but pliant, ivory to light yellow in color, and has considerable luster.

The next best natural fiber for cordage is sisal. Sisal has about

80 per cent of the tensile strength of Manila. Also, its fibers are stiff, harsh, and tend to splinter. Thus, this fiber is normally confined to the smaller size ropes and twines. Sisal rope varies in color from white to yellowish white and lacks the gloss of high-grade Manila. Sisal is not recommended for use where safety is a factor.

Both sisal and Manila fibers deteriorate in contact with acids, caustics, or their vapors, and deterioration is accelerated by hot, humid conditions.

The other natural fibers are employed in limited amounts for various purposes, but the total quantity of these constitutes a very small portion of the over-all total.

Synthetic fibers

The trend today is toward use of synthetic fibers. The main synthetic fibers are outlined in Table II along with some of their key properties. Over-all, synthetic fibers outperform Manila in just about every key char-

TABLE II

Some Synthetic Fibers	
Type	Properties
Nylon	size far size, aver twice as strang as Manila; highly resistant ta flexing, chafing, abrasian; great wet strength retention (only 5 ta 10 per cent lower than dry strength); high stretch and warking elasticity provide excellent energy absarptian; resistant ta camman salvents and alkalies.
Polyester	mare than twice as strong as Manila, wet ar dry; will nat stretch as much as nylan, only slightly mare than Manila, under normal canditions; excellent resistance ta abrasian, chemicals and weathering; recammended wherever minimum stretch, high strength, and durability are needed.
Polyethylene	excellent dielectric properties and chemical resistance; warking elasticity slightly greater than Manila under narmal canditions. Gaad resistance ta abrasian; excellent law temperature flexibility and strength; stronger than Manila; available in bright and eye-catching calars ar calar cambinations.
Polypropylene	outstanding chemical resistance and dielectric properties; warking elasticity lies between nylon and Manila, under narmal canditions; 50 per cent stranger than Manila; lighter than any ather commercial rape.
Polyester-Polyolefin	a unique cambination af polyester and polyolefin fibers; 50 per cent stranger and samewhat lighter than Manila; wan't jump ar jerk; resists damaging effects of flexing, fric-tian and abrasian, wet ar dry; excellent dielectric properties; absarbs shock better than Manila.

TABLE III

Tensile Strength vs. Size for Manila and Synthetic Ropes

		Manila Regular Construction			"Stabilized" Filament Nvlon			Filament			Monopro and Multiopro			Super Polyester- Olefin			Polyester- Olefin		
Recommended Working Load Size in Inches		20% of Tensile Strength			11% of Tensile Strength			11% of Tensile Strength			17% of Tensile Strength			17% of Tensile Strength			17% of Tensile Strength		
Dia.	Cir.	lb/100'	ft/lb	Ten. Str.	lb/100'	ft/lb	Ten. Str.	lb/100'	ft/lb	Ten. Str.	lb/100'	ft/lb	Ten. Str.	lb/100'	ft/lb	Ten. Str.	lb/100'	ft/lb	Ten. Str.
3/16"	5/8"	1.5	66.60	450	1.0*	100.0	1,000	1.2*	83.4	1,000	.70*	143.0	800				.94*	106.5	1,300
	3/4"	2.0	50.00	600	1.5*	66.7	1,650	2.0*	50.0	1,650	1.2*	83.4	1,250				1.61*	62.0	
5/16"	1 "	2.9	34.50	1,000	2.5*	40.0	2,550	3.1*	32.2	2,550	1.8*	55.6	1,900				2.48*	40.4	1,900
3/8"	1 1/8"	4.1	24.40	1,350	3.5	28.5	3,700	4.5	22.2	3,700	2.8*	35.7	2,700	4.0*	25.	2,650	3.64*	27.5	2,700
7/16"	1 1/4"	5.3	19.00	1,750	5.0	20.0	5,000	6.2	16.1	5,000	3.8*	26.3	3,500	5.5*	18.1	3,350	4.82*	20.8	3,500
1/2"	1 1/2"	7.5	13.33	2,650	6.5	15.4	6,400	8.0	12.5	6,400	4.7*	21.3	4,200	6.5*	15.3	4,200	6.02*	16.6	4,400
5/8"	2 "	10.4	9.61	3,450	8.3	12.3	8,000	10.2	9.8	8,000	6.1*	16.4	5,100	9.5*	10.5	6,100	7.4*	13.5	5,400
		13.3	7.50	4,400	10.5	9.5	10,400	13.0	7.7	10,000	7.5*	13.3	6,200	10.5*	9.5	6,700	9.3*	10.7	6,500
3/4"	2 1/4"	16.7	6.00	5,400	14.5	6.9	14,200	17.5	5.7	12,500	10.7	9.3	8,500	15.0*	6.6	8,900	12.9*	7.75	9,000
13/16"	2 1/2"	19.5	5.13	6,500	17.0	5.9	17,000	21.0	4.8	15,500	12.7	7.9	9,900				15.0*	6.66	10,500
7/8"	2 3/4"	22.5	4.45	7,700	20.0	5.0	20,000	25.0	4.0	18,000	15.0	6.7	11,500	20.5*	4.8	11,500	17.7*	5.65	12,000
1 "	3 "	27.0	3.71	9,000	26.0	3.8	25,000	30.5	3.3	22,000	18.0	5.5	14,000	26.5*	3.7	14,000	23.4*	4.28	15,000
1 1/8"	3 1/4"	31.3	3.20	10,500	29.0	3.4	28,800	34.5	2.9	25,500	20.4	4.9	16,000				25.8*	3.87	17,000
1 1/8"	3 1/2"	36.0	2.78	12,000	34.0	2.9	33,000	40.0	2.5	29,500	23.7	4.2	18,300	34.0*	2.9	21,000	29.6*	3.38	20,000
1 1/4"	3 3/4"	41.8	2.40	13,500	40.0	2.5	37,500	46.3	2.2	33,200	27.0	3.7	21,000	39.0*	2.5	24,000	33.5*	2.98	22,000
1 5/8"	4 "	48.0	2.09	15,000	45.0	2.2	43,000	52.5	1.9	37,500	30.5	3.3	23,500	44.0	2.2	27,000	37.4	2.68	25,000
1 1/2"	4 1/2"	60.0	1.67	18,500	55.0	1.8	53,000	66.8	1.5	46,800	38.5	2.6	29,700	55.0	1.8	34,000	46.5	2.15	31,000
1 5/8"	5 "	74.4	1.34	22,500	68.0	1.5	65,000	82.0	1.2	57,000	47.5	2.1	36,000	67.0	1.4	42,000	55.5	1.80	37,000
1 3/4"	5 1/2"	89.5	1.12	26,500	83.0	1.2	78,000	98.0	1.02	67,800	57.0	1.7	43,000	80.0	1.2	50,000	67.2	1.49	43,500
2 "	6 "	108.	.93	31,000	95.0	1.05	92,000	118.0	0.85	80,000	69.0	1.4	52,000	95.0	1.05	60,000	78.0	1.28	52,000
2 1/8"	6 1/2"	125.	.79	36,000	109.0	0.92	106,000	135.0	0.74	92,000	80.0	1.2	61,000	112.0	.89	70,000	90.8	1.10	61,000
2 1/4"	7 "	146.	.68	41,000	129.0	0.77	125,000	157.0	0.64	107,000	92.0	1.1	69,000	127.0	.787	80,000	104.	.96	69,000
2 1/2"	7 1/2"	167.	.59	46,500	149.0	0.67	140,000	181.0	0.55	122,000	107.0	0.93	80,000	147.0	.68	92,000	120.	.83	80,000
2 5/8"	8 "	191.	.52	52,000	168.0	0.59	162,000	205.0	0.49	137,000	120.0	0.83	90,000	165.	.606	105,000	134.	.75	90,000
2 3/4"	8 1/2"	215.	.47	58,000	189.0	0.53	180,000	230.0	0.43	154,000	137.0	0.73	101,000				151.	.66	102,000
3 "	9 "	242.	.42	64,000	210.0	0.47	200,000	258.0	0.39	174,000	153.0	0.65	114,000	208.	.48	130,000	169.	.59	114,000
3 1/4"	10 "	299.	.33	77,000	263.0	0.38	250,000	318.0	0.31	210,000	190.0	0.53	137,000	253	.395	163,000	206.	.48	138,000
3 1/2"	11 "	367.	.27	91,000	316.0	0.32	300,000	384.0	0.26	254,000	232.0	0.43	162,000				248.	.40	165,000
4 "	12 "	436.	.23	105,000	379.0	0.26	360,000	460.0	0.22	300,000	275.0	0.36	190,000				293.	.34	192,000

*Manufactured Regular Construction (Plied Yarns).

Monilo manufactured to Fed. Spec. TR605b.

Monopro is monofilament polypropylene.

Multiopro is multifilament polypropylene.

Spun Nylon Rope is offered in sizes 1" Dia. and smaller. Strength is approximately 35% less than Filament Nylon but the weight is about the same.

Polyethylene is 5% heavier than Polypropylene and approximately 5% weaker.

Spun Rope is offered in sizes 1" Dia. and smaller. Strength is approximately 25% less than Filament Dacron but the weight is about the same.

Polyester-Olefin and Super Polyester-Olefin is Polyester-Olefin Cover Yarns over Poly-Olefin or Nylon Center Yarns.

Duo-Syn (8 strand plaited) construction is approximately 5% heavier than 3 strand.

Four Strand hard and soft lay ropes vary slightly from above figures.

Subject to change due to material available. All figures apply to new rope only. Manila footage and strength figures are minimum values. Synthetic figures are overage with the minimum footage 5 per cent below and the minimum strength 5 per cent below these figures.

Strength figures are based on loading at a low rate of speed according to Government specifications and do not cover exceptional conditions such as shock loadings or sustained loads.

acteristic. Of course, Manila still maintains the advantage of lower initial cost, although, if used properly, synthetic fibers can overcome even this disadvantage by outwearing Manila.

Rope Construction

There are several fabrications possible for each type of material. Ropes are generally made of three or four strand constructions. Ordinarily, this involves twisting fibers into yarns, then twisting several

yarns into strands and finally twisting three, four, or more strands into rope. But in recent years such new constructions as plait and braid have been developed—further complicating the proper selection of rope. Actually, the new constructions have been primarily developed to prevent hockling and rotation.

Plaited rope is constructed so that eight strands are combined so that there are four left-twisted strands intermixed with four right-twisted strands. One set of strands counteracts the other, neutralizing the twist in the rope. It does not

have a tendency to turn when a force is applied to it, nor, in the case of synthetics where a free end is involved (such as lifting an object with a crane), the turn will not run out of the rope and cause a hockle when the strain is released.

Braided rope resembles plaited construction except it is made up of a great number of yarns instead of strands. There is an equal number of left and right turn yarns so that it too is balanced and will resist twisting and hockling. It has a very smooth cylindrical surface, which makes it more difficult to

grasp and hold with bare hands. Braided rope requires a special tool for splicing, the size of which depends on the size of the rope. Due to its double construction, it is very difficult to inspect the inner yarns for damage.

Experimentation with new construction techniques adds to the confusion. A recent development of one new type of rope was made by paralleling low twist yarns—each under as nearly equal tension as possible—and holding the bundle together by extruding a plastic jacket over them. This construction permits utilization of about 70 to 75 per cent of fiber strength with a minimum of internal abrasion and does not introduce additional elongation as does lay in conventional rope.

Another factor affecting correct use of rope is size. Of particular importance is that tensile strength of a rope varies with rope size and fiber material. This is demonstrated in Table III, which outlines tensile strength for various sizes of Manila and synthetic ropes.

Consultations, Inspection, Care

It is easy to note from the above

the difficulties that can arise when it comes time to select the correct rope for a particular job. It is often highly advisable to consult the manufacturer or his representatives to determine what kind of rope is needed.

Safety, of course, only begins with the selection of the correct rope. Constant inspections and continued care of any rope in use is absolutely necessary in order to insure continued safety.

Inspection

All new rope should be inspected for irregularities before it is put into use. Used rope should be inspected on a periodic basis, probably every 30 days under ordinary conditions and much more often if lives are directly dependent upon the rope usage.

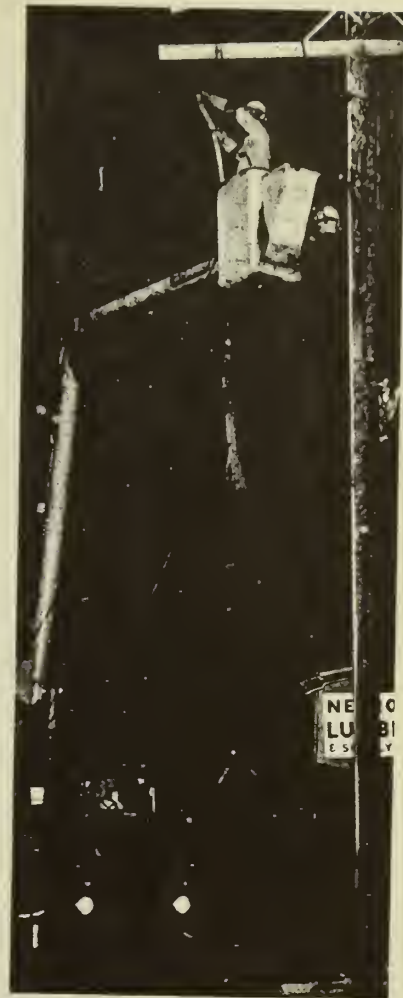
Important conditions to be looked for during inspection include:

On the surface of the rope:

- Abrasion (broken fibers or yarns)
- Soft spots or general softness



Reading from the outside to the inside, the ropes illustrated are nylon, Manila, polypropylene, polyester, polyester-polyolefin, and polyethylene. All shown are three-stranded.



This linemen should be using a polypropylene rope, which has been specially treated to resist conduction of electricity when wet. (Photograph courtesy of Niagara Mohawk Power Corp.)

(this is a sure sign of badly worn rope)

- Decayed or burnt by hot, corrosive, or caustic substances such as paraffin, solder, or chemicals
- Cutting in or drawing down of one strand

Internal inspection would seek:

- Broken fibers or yarns
- Powdering in center of rope at strand axis (a sign of great strains or grit)
- Dry rot or mildew
- Any change in color of fiber yarn or strand

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

3rd QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH September 30, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	FATAL #			
Washington Office	340	459,048					
Denver Office	1,414	2,129,952	1		11	0.5	5
REGION 1							
Boise Regional Office	186	226,090					
Baker Project	45	10,375					
Central Snake Project	45	60,629					
Chief Joseph Dam	40	57,718					
Columbia Basin Project	927	1,454,032	2		57	1.4	39
Green Springs Powerplant	3	3,084					
Hungry Horse Project	48	71,295					
Lower Columbia Development Office	52	62,646					
Lower Teton	8	7,739					
Mann Creek Project		1,972					
Minidoka Project	69	106,462					
Snake River Development Office	53	89,307					
Spokane Valley		2,584					
Third Powerplant Constr. Office	192	269,199	2		150	7.4	557
Upper Columbia Development Office	49	69,140					
Wild Horse Dam	22	26,850					
Yakima Project	30	40,906					
Totals & Averages	1,724	2,561,228	4		207	1.6	81
REGION 2							
Sacramento Regional Office	574	974,025	1		3	1.0	3
Regional Drill Crews	40	62,118	1		100	16.1	1,610
Auburn-Folsom South Unit CVP	168	246,973					
Cachuma Operations Field Branch	2	3,056					
Central Coast Dev. Field Branch	3	4,960					
Folsom Field Division	72	109,490					
Fresno CVP Construction Office	123	167,229					
Fresno Field Division	139	212,232					
Klamath Project Office	19	30,760					
Lahontan Basin Projects Office	68	100,360					
Napa Development Field Branch	3	4,484					
Red Bluff CVP Construction Office	36	62,548					
San Luis Unit CVP Construction Office	190	377,272					
Shasta Field Division	138	210,877	1		27	4.7	128
Solano Operations Field Branch	3	3,216					
Tracy Field Division	156	246,972	1		26	4.0	105
Transmission Lines Office - Reno		16,262					
Upper North Coast Dev. Field Branch	4	6,119					
Willows CVP Construction Office	105	161,768					
Totals & Averages	1,843	3,000,721	4		156	1.3	52
REGION 3							
Boulder City Regional Office	175	264,400					
Boulder Canyon Project	154	233,016					
Dixie Project	5	7,800					
Mead Construction Office	29	38,554					
Lower Colorado River Project	189	267,068	1		83	3.7	311
Parker-Davis Project	317	530,196					
Phoenix Development Office	93	135,680					
Southern California Dev. Office	27	50,884					
Southern Nevada Water Project	53	67,173					
Transmission Lines Office	7	20,414					
Yuma Projects Office	148	230,011	1		90	4.3	391
Totals & Averages	1,197	1,845,296	2		173	1.1	94
REGION 4							
Salt Lake City Regional Office	222	356,549					
Central Utah Projects	202	314,687					
CSP Montrose	278	418,551	1		10	2.4	24
Curecanti Unit	72	123,929					
Durango Projects Office	25	47,760					
Grand Junction Projects Office	47	80,730					
Logan Development Office	9	14,112					
Lyman Project	32	43,936					
Upper Green River Dev. Office	21	27,828					
Weber Basin Project	40	88,272	1		17	11.3	193
Totals & Averages	948	1,516,354	2		27	1.3	18
REGION 5							
Amarillo Regional Office	111	155,398					
Albuquerque Development Office	33	51,338					
Arbuckle Project		3,450					
Austin Development Office	47	73,920					
Canadian River Project	3	39,921					
Lower Rio Grande Project	2	3,056					
Middle Rio Grande Project	211	324,909					
Rayado Project	78	130,601					
Oklahoma City Development Office	20	27,087					
Pecos River Basin Project	6	9,399					
Rio Grande Project	218	335,667	1		14	3.0	42
San Juan-Chama Project	78	121,425					
Totals & Averages	807	1,276,291	1		14	0.8	11
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT GOVERNMENT FORCES

3rd QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH September 30, 1968

PERIOD FROM JANUARY 1, 1930 -- THROUGH September 30, 1939.							
REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL *	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	164	234,400					
Geology and Drill Crews	8	17,280					
Canyon Ferry Project	22	27,403					
Fort Peck Project	40	51,284					
Missouri-Oahe Projects	219	297,600					
Missouri-Souris Projects	268	309,747					
Power System Operations Office	49	71,120					
Riverton Project	5	7,573					
Upper Missouri Projects	83	138,242	1		6	7.2	43
Yellowtail Construction Office	25	47,771					
Yellowtail Project Office	30	45,848					
Totals & Averages	913	1,248,268	1		6	0.8	5
REGION 7							
Denver Regional Office	215	324,408	1		2	3.1	6
Fryingpan-Arkansas Project	185	331,144					
Glen Elder Unit	68	117,296	1		11	8.5	94
Kansas River Projects	96	141,200					
Miobraska-Lower Platte Dev. Office	28	46,520					
North Platte River Projects	236	362,469					
South Platte River Projects	162	250,828					
Totals & Averages	990	1,573,865	2		13	1.3	8

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

CONTRACTOR FORCES

3rd QUARTER, 1968

PERIOD FROM JANUARY 1, 1968... THROUGH ~~September 30, 1968~~

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR			
REGION 1							
Baker Project		8,260					
Chief Joseph Dam	55	46,567					
Columbia Basin Project	230	246,434	3		79	12.2	321
Green Springs Powerplant	2	40					
Hungry Horse Project		103					
Lower Teton	1	5,856					
Mann Creek Project		1,071					
Minidoka Project		18,210	2		81	109.8	4,448
Snake River Development Office		5,001					
Spokane Valley Project		266					
Third Powerplant Construction Office	403	725,313	5		472	6.9	661
Wild Horse Dam	73	47,609	4		121	84.0	2,541
Yakima Project		13,718					
Totals & Averages	854	1,118,448	14		753	12.5	673
REGION 2							
Auburn-Folsom South Unit CVP Office	48	62,350					
Folsom Field Division		204					
Fresno CVP Construction Office	165	147,833					
Fresno Field Division		1,223					
Lahontan Basin Projects Office	181	191,797	1		45	5.2	235
Red Bluff CVP Construction Office	93	91,723					
San Luis Unit CVP Construction Office	187	160,101					
Tracy Field Division	3	772					
Willows CVP Construction Office	197	183,919	1		55	5.4	299
Totals & Averages	874	839,922	2		100	2.4	119
REGION 3							
Boulder Canyon Project		2,234					
Lower Colorado River Project	13	85,772					
Mead Construction Office	30	86,424					
Southern California Development Office		2,984					
Southern Nevada Water Project	54	20,741					
Parker-Davis Project Office	22	32,637					
Yuma Projects	63	64,137	1		60	15.6	935
Totals & Averages	182	290,929	1		60	3.4	206
REGION 4							
Central Utah Project	328	323,885	3		89	9.3	275
CRSP Montrose	15	11,526	1		30	86.8	2,603
Curcanti Unit	109	162,295	1		10	6.2	62
Durango	6	4,414					
Grand Junction Projects Office	3	872					
Lyman Project	98	74,765					
Upper Green River Development Office	3	4,200					
Weber Basin Project	16	29,718					
Totals & Averages	598	611,675	5		129	8.2	211
REGION 5							
Amarillo Regional Office	7	3,855					
Arbuckle Project		2,541					
Canadian River Project		10,923					
Navajo Project	184	189,483	8		139	20.5	357
Pecos River Basin Project	1	9,750					
Rio Grande Project	3	2,469					
San Juan-Chama Project	578	936,834	11	2	12,266	11.7	13,093
Totals & Averages	773	1,355,855	19	2	12,405	14.0	9,149
REGION 6							
Missouri-Osage Projects	145	68,558					
Missouri-Souris Projects	39	17,590					
Riverton Project	4	9,036					
Upper Missouri Projects	93	156,479					
Yellowtail Construction Office	69	107,316	2		30	18.6	280
Totals & Averages	350	358,979	2		30	5.6	84
REGION 7							
Dryden-Arkansas Project	305	793,014	22	1	6,339	27.7	7,994
Glen Elder Unit	138	333,135	2	1	6,002	6.0	18,017
Kansas River Projects	3	14,041					
Mohrara-Lower Platte Dev. Office	1	3,278					
North Platte River Projects	56	26,167					
South Platte River Projects	2	1,140					
Totals & Averages	508	1,170,775	24	2	12,341	20.5	10,541
CONSOLIDATED TOTALS							
	4,139	5,746,583	67	4	25,818	11.7	4,493
TOTALS LAST YEAR (1967)							
	3,975	10,218,673	155	5	35,271	15.2	3,452

* FATALITIES INCLUDED IN TOTAL DISABLING

GPO 847-036

ONE ACCIDENT CASTS A BIG SHADOW



WORK WITH CARE
AT HOME AND ON THE JOB !

805
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**MISSION
SAFETY**

70

RECLAMATION SAFETY NEWS



Annual Report 1968

THE BUREAU OF THE
CHIEF ENGINEER
BUREAU OF RECLAMATION
DEPARTMENT OF THE INTERIOR
UNITED STATES



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
OFFICE OF CHIEF ENGINEER



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SAFETY NEWS is published quarterly by the Office of
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Denver, Colorado, in the interest of
accident prevention.

BUREAU SAFETY PERFORMANCE

1968 CUMULATIVE SAFETY RECORD

January 1 - December 31, 1968

A. GOVERNMENT FORCES

<u>Region</u>	<u>Injury index*</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Vehicle accident rate</u>
Region 6	0.02	0.6	4	1.6
Region 7	0.2	1.5	11	2.9
Region 5	0.2	1.2	14	3.2
Region 4	0.4	1.5	26	1.6
Region 2	0.6	1.3	45	2.0
Region 3	0.6	0.8	71	3.4
Region 1	<u>1.2</u>	<u>1.8</u>	<u>64</u>	<u>3.5</u>
Totals to Date	0.4	1.1	33	2.6
<hr/>				
Totals 1967	18.0	2.7	665	3.1

*Injury index is equal to frequency rate times severity rate divided by 100.

B. CONTRACTOR FORCES

<u>Region</u>	<u>Injury index</u>	<u>Frequency rate</u>	<u>Severity rate</u>	<u>Fatal injuries</u>
Region 3	4.3	2.7	160	0
Region 6	13.7	9.4	146	0
Region 4	13.9	8.2	169	0
Region 2	19.0	5.2	365	0
Region 1	664.9	14.6	4,554	1
Region 5	951.5	13.5	7,048	2
Region 7	<u>2,662.9</u>	<u>19.8</u>	<u>13,449</u>	<u>3</u>
Totals to Date	621.0	12.2	5,090	6
<hr/>				
Totals 1967	524.7	15.2	3,452	5

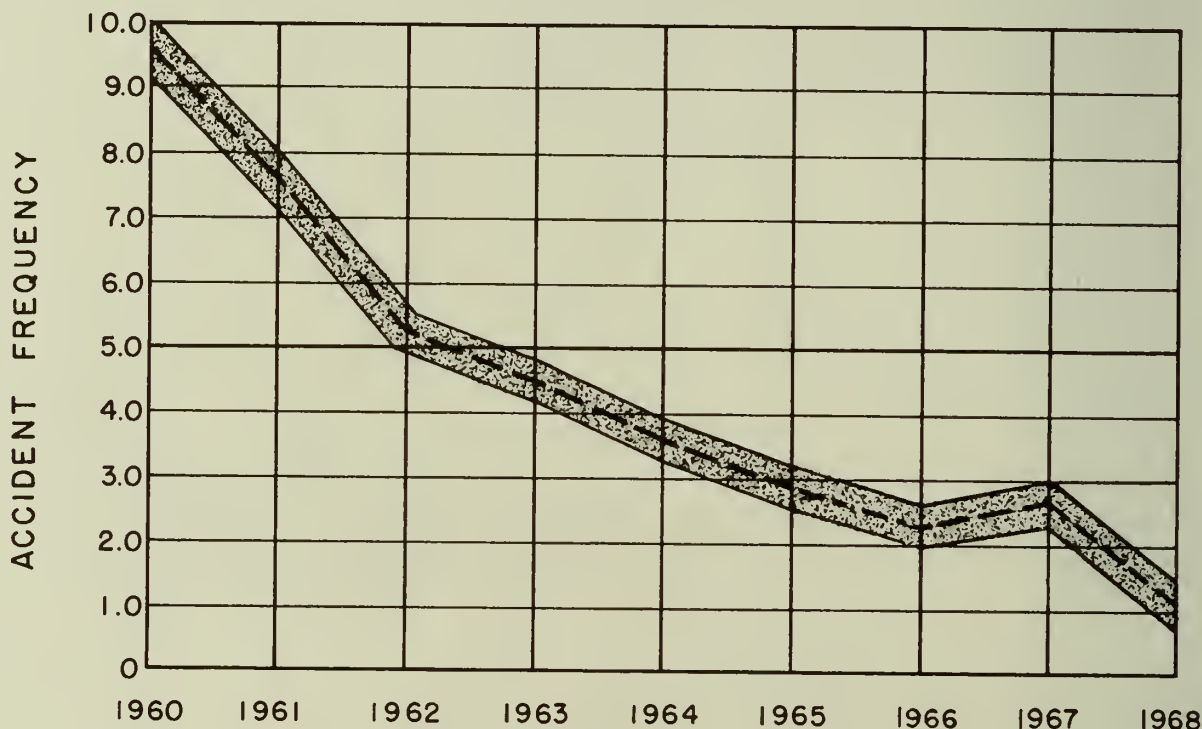
BUREAU CONTRACTORS' 3-YEAR AVERAGE (1966-1968)

Frequency rate	13.7
Severity rate	5,329

C. RECLAMATION JOB CORPS CONSERVATION CENTERS

Frequency rate	2.6
Severity rate	2,490
Vehicle accident rate	15.8

GOVERNMENT FORCES



TREND and OUTLOOK

BUREAU-WIDE -- During 1968 over 10,000 Bureau employees worked 20,635,525 man-hours experiencing only 23 minor disabling injuries. The resulting cumulative accident frequency rate of 1.1 and the accident severity rate of 33 represents Reclamation's finest safety achievement. Significantly, 4 of the 7 Regions reported a substantial improvement in their accident records compared with previous years. In addition to fewer personal injuries, this exemplary safety record reflects a plus in reduced operating costs and greater utilization of available manpower.

The following comparisons are presented in order that this achievement can be considered in its true perspective:

- In 1965, the previous best year, Bureau employees experienced 65 disabling injuries and no fatalities, resulting in an accident frequency rate of 2.8 and a severity rate of 264.
- The 1967 accident frequency rate for the Department of the Interior was 6.0 -- the lowest accident frequency rate of record.
- Direct cost of personal injuries was \$107,714, compared with a 5-year average of \$163,178 -- a 34 percent reduction!
- Mission SAFETY-70 -- Reclamation's 1968 frequency rate represents a 70 percent reduction compared with the base year 1964 and the President's goal of 30 percent reduction by 1970.

In the final analysis, safety achievement must be measured first by the ability to perform our work without serious injury or death, and, secondly, by reduced accident costs. On both counts, Reclamation's accident experience during 1968 must be considered a highly satisfactory and commendable safety achievement.

REGIONAL -- Without exception, all Regions experienced exemplary accident records, reflected in low accident frequency rates and the absence of fatal or serious injuries. All Regions completed the year with accident frequency rates lower than the previous Bureau-wide record low of 2.3 recorded in 1966. Region 6 earned the Commissioner's Award for 1968 for having experienced only one disabling injury, an accident frequency rate of 0.6, and a severity rate of 4.

WORK ACTIVITY -- Project Investigations and Administrative Services, with accident frequency rates of 0.4 and 0.6, respectively, had the best accident records. Irrigation O&M, Construction, and Power O&M experienced the highest accident frequency rates (1.9, 1.8, 1.6), but significantly showed a marked improvement as compared with frequency rates of 6.3, 4.5, and 3.6 in 1967. Considering manpower utilization, Bureau work activities incurred a loss of 684 man-days due to injuries during 1968 as compared with a loss of 14,182 man-days the previous year.

VEHICLE ACCIDENTS -- Bureau drivers logged over 37 million miles, were involved in 97 vehicle accidents, and set a new record low vehicle accident frequency rate of 2.6 accidents per million miles. For 5 consecutive years Bureau drivers have enjoyed a vehicle accident frequency rate of 3.1 or less as compared with an average vehicle accident frequency rate of 12.0 for Government agencies. Dollarwise, \$13,300 was spent to repair Bureau vehicles damaged in accidents as compared with an average annual expenditure of \$25,000 during the previous 5 years. Participation in the National Safety Council Driver Improvement Program, together

with the continued emphasis placed on safe and responsible vehicle operation is obviously responsible for this achievement. (Note: Damage to Government vehicles constitutes only a portion of the dollar cost of vehicle accidents. Third party claims for personal injury and property damage represent the greatest potential loss factor.)

FIRE PREVENTION -- Unbelievably, only one minor fire was reported during 1968 resulting in a loss of \$350. With the exception of a major fire in 1965, Bureau fire losses have averaged less than \$5,000 per year over the past 5 years. Considering the nature of Bureau facilities, which include generating plants, electrical substations, pumping plants, repair shops, warehouses, and offices, the record can only attest to the effectiveness of our fire prevention and protection efforts. The record includes Bureau Job Corps Civilian Conservation Centers where no fire losses were experienced.

PROPERTY DAMAGE -- Reportable property damage from accidental causes, other than vehicle accidents, amounted to \$20,410 in 1968. (This figure predominantly represents the amount of property damage resulting from accidents involving personal injury and is not an accurate indication of the extent of accidental property damage.)

JOB CORPS CENTERS -- Except for drownings, the safety record in Bureau Job Corps Civilian Conservation Centers continued to improve. During 1968, 19 corpsmen and staff personnel suffered disabling injuries while accumulating over 7,000,000 man-hours of exposure. As stated, the Centers experienced no fire losses and the vehicle accident frequency rate of 15.8, which is still too high, was reduced 48 percent as compared with 1967. Unfortunately, 3 corpsmen lost their lives as a result of drowning accidents during the year. Every effort has been made to waterproof Bureau Job Corps Centers, including provision for swimming instruction for enrollees, safe pools and beaches equipped with adequate rescue devices, and constant surveillance of all water sports by supervisors qualified in lifesaving and water-rescue techniques.

PUBLIC SAFETY -- During calendar year 1968, 28 public drownings occurred in Bureau-operated canals and reservoirs. This compares with 19, 15, and 25 drownings in 1967, 1966, and 1965, respectively. Each year the public exposure, particularly on our lakes and reservoirs, continues to increase. Safety of the public is thoroughly considered in both the design and operation of all Reclamation projects. Also, Bureau Regions and operating offices are continuing to cooperate with the adjacent communities in carrying out a public awareness program known as "Operation Westwide." In effect, it is our endeavor to permit maximum enjoyment of Bureau recreational areas at minimum risk to the public.

ACCOMPLISHMENTS

Following is a summarization of special accomplishments and highlights of specific accident prevention projects undertaken or continued by Reclamation during calendar year 1968:

SAFETY TRAINING -- Recognizing that safety education and training is the cornerstone of effective accident prevention, Reclamation continued to provide safety training under the following established training programs:

During 1968, an additional 1,418 employees successfully completed the 10-hour National Safety Council Driver Improvement Program, bringing the total to 9,578 since the inception of the course in 1965. In 1968, the 30-hour Safety Training Course for Construction Supervisors was extended to cover Operation and Maintenance personnel as well as construction supervisors and inspectors. To date 1,228 Bureau employees in these employment categories have completed the training. During the year 1,652 Bureau employees completed either the initial training or a refresher course in Bureau of Mines or American Red Cross first aid instruction. Under a program initiated in October 1967, Bureau electrical and maintenance supervisors are conducting courses in electrical safety for non-Bureau electricians and to linemen who perform work in Reclamation-owned substations.

PHYSICAL FITNESS PROGRAM -- In 1967, the Columbia Basin Project initiated a physical fitness qualification program. The program, in addition to requiring preemployment medical examinations, provides for periodic physical examination of employees engaged in occupations or in jobs where ill health or physical limitations could endanger themselves or others. The results of this pilot program have proven beneficial to both the Bureau and the employees. In addition to advancing safety, the examinations were instrumental in improving job performance and operating efficiency. The program has since been extended Regionwide and is currently under consideration for Bureau-wide adoption as a management improvement project.

NOISE CONTROL -- A noise control program initiated by the Bureau in 1968 provides for sound surveys to be conducted of all Bureau facilities, where high noise levels could present a hazard to persons. Special attention is given to elements of the Bureau's activities associated with the operation of mechanical and hydraulic machinery. Studies are made to determine what types of acoustical treatment are best suited to eliminate harmful or bothersome noise levels. The studies are also utilized to contribute to the knowledge of the effectiveness of design criteria currently being followed to reduce noise levels in the Bureau.

The program sets forth safe noise-level thresholds and provides for frequent monitoring in order to protect Bureau personnel and the public from harmful noise levels. Safe noise-level thresholds have been established and trained personnel are available in each region to monitor operations or areas where high noise levels are suspect, and to apply necessary environmental noise control criteria.

CONSTRUCTION SAFETY -- In June 1968, the Bureau of Reclamation published "Construction Safety Standards," a pocket-sized manual that is believed to be the most comprehensive construction safety document of its kind. The 379-page manual supersedes the Bureau's earlier publication, "Safety Requirements for Construction by Contract," whose last printing was in July 1964. Much of that publication's content has been revised, updated, and included in the new manual in more attractive and usable format.

"Construction Safety Standards" establishes contractual health and safety requirements for Bureau of Reclamation construction by contract. It includes sections on 27 categories of construction operations, 9 tables of standards, and 24 line illustrations. Included are safety standards relating to machinery and mechanized equipment, excavation operations, blasting operations, concrete operations, structural steel erection, transmission line construction, stage construction in energized substations, marine and diving operations, etc. Since publication of the new manual, special instructions sessions are being conducted in all Bureau construction offices in order to acquaint construction personnel with the revised safety requirements.

"Construction Safety Standards" was prepared with the cooperation of The Associated General Contractors of America, the United States of America Standards Institute, the Society of Automotive Engineers, manufacturers of construction equipment, labor unions, and others concerned with the improvement of safety in the construction industry. Copies of the manual are available to the public at \$2.40 per copy from the Bureau of Reclamation, Denver Federal Center, Denver, Colorado 80225, Attention: 841.

PUBLIC SAFETY -- Within Reclamation there has been a continuing and increasing concern over drownings in Bureau constructed canals. As a result, in 1968 a research project was initiated to study means of reducing the hazard to both persons and animals in Bureau canals and laterals.

OUTLOOK

The above accomplishments represent but a few of the projects that have been initiated and are being carried out in an endeavor to improve Reclamation's safety effort. The success of the program is reflected in both dollar savings and greater manpower utilization in Reclamation operations. These accomplishments justify our belief in the concept that effective safety is good business: And that accident prevention is simply another function of good management, and therefore must be considered in all decisions relating to the method of doing business. Continued improvement will be contingent upon how well we apply this concept.

THE RECORD

The following accident statistical tabulations indicate areas of strength and weakness and should be helpful in directing our efforts to specific locations, operations, and phases of accident prevention requiring improvement.

WORK ACTIVITY - BUREAU-WIDE

<u>Type of work</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Administration	8, 527, 578	5	48	0.0	6
Construction	3, 298, 652	6	340	1.8	103
Investigation	2, 278, 649	1	100	0.4	44
Irrigation O&M	2, 678, 080	5	103	1.9	38
Power O&M	<u>3, 852, 366</u>	<u>6</u>	<u>93</u>	<u>1.6</u>	<u>24</u>
1968 Totals	20, 635, 325	23	684	1.1	33
1967 Totals	21, 341, 433	57	14, 182	2.7	665

ORGANIZATIONAL UNIT

Washington Office

<u>Major activity</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
1968 Totals	628, 560	0	0	0.0	0
1967 Totals	708, 752	0	0	0.0	0

Denver Office

1968 Totals	2, 841, 280	1	11	0.4	4
1967 Totals	2, 860, 888	1	125	0.3	44

Region 1

Major activity	Man-hour exposure	Disabling injuries	Days lost	Frequency rate	Severity rate
Administration	676,825	0	0	0.0	0
Construction	598,272	2	150	3.3	251
Investigations	378,222	0	0	0.0	0
Irrigation O&M	866,964	2	46	2.3	53
Power O&M	<u>882,707</u>	<u>2</u>	<u>23</u>	<u>2.3</u>	<u>26</u>
1968 Totals	3,402,990	6	219	1.8	64
1967 Totals	3,219,994	14	392	4.3	122

Region 2

Administration	1,153,665	2	26	1.7	23
Construction	872,712	0	0	0.0	0
Investigations	702,771	1	100	1.4	142
Irrigation O&M	617,641	1	26	1.6	42
Power O&M	<u>611,049</u>	<u>1</u>	<u>27</u>	<u>1.6</u>	<u>44</u>
1968 Totals	3,957,838	5	179	1.3	45
1967 Totals	4,156,587	5	88	1.2	21

Region 3

Administration	705,926	0	0	0.0	0
Construction	481,971	2	173	4.1	359
Investigations	268,275	0	0	0.0	0
Irrigation O&M	168,320	0	0	0.0	0
Power O&M	<u>797,792</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	2,422,284	2	173	0.8	71
1967 Totals	2,344,330	16	6,963	6.8	2,970

Region 4

Administration	824,248	0	0	0.0	0
Construction	358,256	0	0	0.0	0
Investigations	229,468	0	0	0.0	0
Irrigation O&M	84,828	1	17	11.8	200
Power O&M	<u>459,373</u>	<u>2</u>	<u>33</u>	<u>4.4</u>	<u>72</u>
1968 Totals	1,956,173	3	50	1.5	26
1967 Totals	2,243,372	3	358	1.3	160

Region 5

Major activity	Man-hour exposure	Disabling injuries	Days lost	Frequency rate	Severity rate
Administration	378,639	0	0	0.0	0
Construction	312,344	0	0	0.0	0
Investigations	203,404	0	0	0.0	0
Irrigation O&M	712,034	1	14	1.4	20
Power O&M	<u>81,873</u>	<u>1</u>	<u>10</u>	<u>12.2</u>	<u>122</u>
1968 Totals	1,688,294	2	24	1.2	14
1967 Totals	1,836,173	9	129	4.9	70

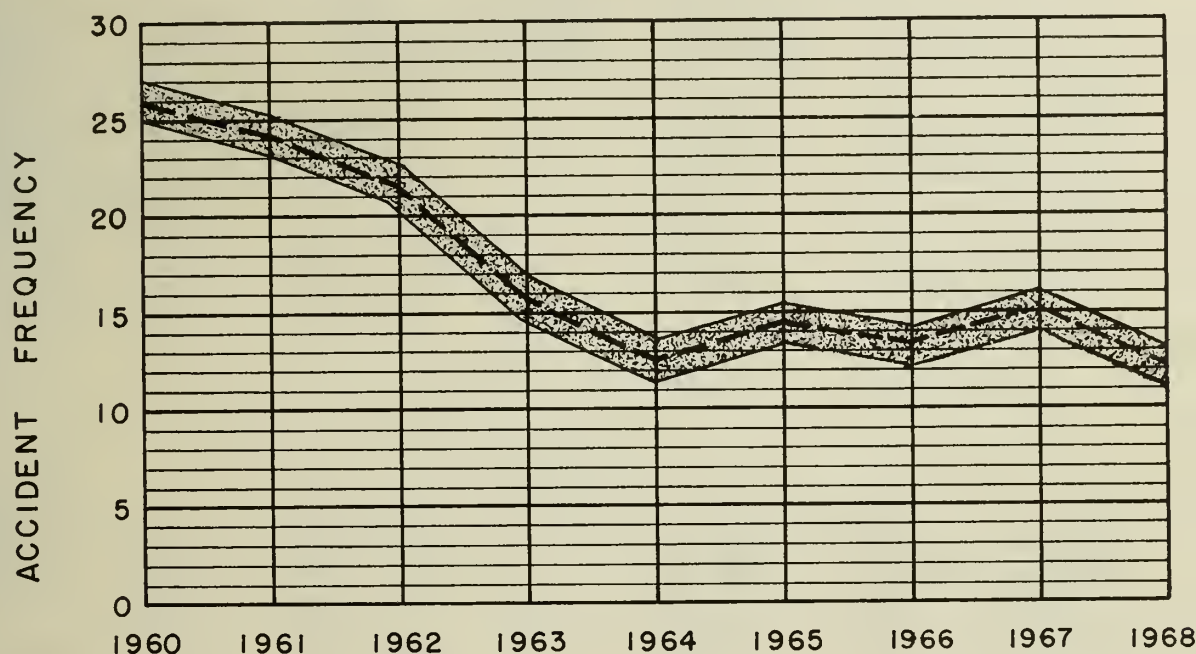
Region 6

Administration	580,915	0	0	0.0	0
Construction	235,666	1	6	4.2	25
Investigation	314,965	0	0	0.0	0
Irrigation O&M	117,453	0	0	0.0	0
Power O&M	<u>431,186</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	1,680,185	1	6	0.6	4
1967 Totals	1,562,863	5	76	3.2	49

Region 7

Administration	737,520	2	11	2.7	15
Construction	439,431	1	11	2.3	25
Investigations	181,544	0	0	0.0	0
Irrigation O&M	110,840	0	0	0.0	0
Power O&M	<u>588,386</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	2,057,721	3	22	1.5	11
1967 Totals	2,322,266	3	6,041	1.3	2,601

CONTRACTOR FORCES



THE RECORD

WORK ACTIVITY - CONTRACTOR FORCES

<u>Type of work</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	1, 120, 391	12	373	10.7	333
Concrete dams	713, 379	16	6, 694	22.4	9, 383
Earth dams	1, 553, 209	12	6, 153	7.7	3, 961
Tunnels	2, 181, 785	43	18, 903	19.7	8, 664
*Power facilities	809, 744	3	211	3.7	261
Miscellaneous	1, 188, 568	6	6, 179	5.0	5, 199
1968 Totals	7, 567, 076	92	38, 513	12.2	5, 090
1967 Totals	10, 218, 673	155	35, 271	15.2	3, 452

*Covers transmission lines and substations.

ORGANIZATIONAL UNIT

Region 1

<u>Major activities</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	327,856	5	95	15.3	290
Concrete dams	589,222	14	6,663	23.8	11,309
Earth dams	37,644	0	0	0.0	0
Tunnels	105,926	1	45	9.4	425
Power facilities	421,845	2	81	4.7	192
Miscellaneous	<u>29,124</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	1,511,617	22	6,884	14.6	4,554
1967 Totals	709,672	11	141	15.5	199

Region 2

Canals	315,796	2	115	6.3	364
Earth dams	235,605	1	45	4.2	191
Tunnels	109,902	0	0	0.0	0
Power facilities	70,990	1	130	14.1	1,831
Miscellaneous	<u>416,785</u>	<u>2</u>	<u>129</u>	<u>4.8</u>	<u>310</u>
1968 Totals	1,149,078	6	419	5.2	365
1967 Totals	2,633,711	27	857	10.3	325

Region 3

Canals	168,888	1	60	5.9	355
Tunnels	59,308	0	0	0.0	0
Power facilities	130,233	0	0	0.0	0
Miscellaneous	<u>17,462</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	375,891	1	60	2.7	160
1967 Totals	751,883	12	583	16.0	775

Region 4

<u>Major activities</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	10,168	0	0	0.0	0
Concrete dams	94,303	1	10	10.6	106
Earth dams	481,264	2	50	4.2	104
Tunnels	104,165	2	47	19.2	451
Power facilities	10,232	0	0	0.0	0
Miscellaneous	<u>148,524</u>	<u>2</u>	<u>36</u>	<u>13.5</u>	<u>242</u>
1968 Totals	848,656	7	143	8.2	169
1967 Totals	1,446,695	13	6,332	9.0	4,377

Region 5

Canals	256,427	3	90	11.7	351
Earth dams	344,516	7	56	20.3	163
Tunnels	1,151,918	14	12,425	12.2	10,786
Miscellaneous	<u>30,830</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	1,783,691	24	12,571	13.5	7,048
1967 Totals	1,622,555	30	2,183	18.5	1,345

Region 6

Canals	16,951	1	13	59.0	767
Concrete dams	29,854	1	21	33.5	703
Earth dams	195,430	0	0	0.0	0
Tunnels	82,457	3	44	36.4	534
Power facilities	143,293	0	0	0.0	0
Miscellaneous	<u>65,097</u>	<u>0</u>	<u>0</u>	<u>0.0</u>	<u>0</u>
1968 Totals	533,082	5	78	9.4	146
1967 Totals	212,886	1	7	4.7	33

Region 7

<u>Major activities</u>	<u>Man-hour exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Canals	24,305	0	0	0.0	0
Earth dams	258,750	2	6,002	7.7	23,196
Tunnels	568,109	23	6,342	40.5	11,163
Power facilities	33,151	0	0	0.0	0
Miscellaneous	<u>480,746</u>	<u>2</u>	<u>6,014</u>	<u>4.2</u>	<u>12,510</u>
1968 Totals	1,365,061	27	18,358	19.8	13,448
1967 Totals	2,831,759	61	25,168	21.5	8,888

ACCOMPLISHMENTS

EQUIPMENT SAFETY STANDARDS -- In reviewing the fatal accidents which Bureau contractors have experienced during a 3-year period, it was disclosed that 20 of 24 fatalities--over 80 percent--resulted from the operation of construction equipment. Four of the deaths were directly attributable to equipment rollover or upset. In revising our construction safety requirements, an attempt was made to cope with the high evidence of serious injuries and deaths resulting from equipment operation, particularly heavy-duty, off-highway, earthmoving equipment.

The equipment section of Reclamation's "Construction Safety Standards," published June 1, 1968, provides for the installation of rollover protection and emergency braking systems on heavy-duty, off-highway, earthmoving equipment, specifically scrapers, trucks, and front-end loaders. Roll bars are required on farm-type tractors, and seat belts are required on all machines equipped with rollover protective devices. Self-propelled crawler-type tractors and loaders are required to be equipped with heavy-duty protective canopies meeting specific design standards. The foregoing equipment safety requirements also apply to similar machines owned and operated by the Bureau of Reclamation.

INDUSTRY COOPERATION AND PARTICIPATION -- Through the medium of joint Contractor-Bureau Task Force Committees, we are continuing to cooperate with industry representatives in an endeavor to improve the safety record in construction. The Bureau's Chief Engineer and Chief Safety Engineer participated as guest speakers in the Associated General Contractors' National Safety Conference in Washington, D.C., during February 1968. The Chief Safety Engineer continued to represent both Reclamation and the American Concrete Institute on the A-10 Committee of the United States of America Standards Institute. This Committee has undertaken the updating and improvement of safety standards for construction and demolition operations.

* * * * *

RECLAMATION JOB CORPS CENTERS

1968 CUMULATIVE ACCIDENT RECORD

<u>Region</u>	<u>Man-hours exposure</u>	<u>Disabling injuries</u>	<u>Days lost</u>	<u>Frequency rate</u>	<u>Severity rate</u>
Region 1	2, 275, 000	3	15	1.3	7
Region 2	1, 166, 692	4	6, 069	3.4	5, 202
Region 4	1, 801, 952	2	6, 004	1.1	3, 332
Region 5	820, 244	4	6, 010	4.9	7, 327
Region 7	1, 267, 120	6	157	4.7	124
Totals	7, 331, 008	19	18, 255	2.6	2, 490

SERIOUS ACCIDENTS OR FATALITIES

<u>Date</u>	<u>Occupation</u>	<u>Description</u>	<u>Days lost</u>
5-10-68	Job Corps enrollee	Accidentally drowned while swimming	6, 000*
5-20-68	Job Corps enrollee	Accidentally drowned while swimming	6, 000*
6-28-68	Job Corps enrollee	Accidentally drowned while swimming	6, 000*

*Fixed time charge for fatality.

VEHICLE ACCIDENT EXPERIENCE

<u>Region</u>	<u>No. of accidents</u>	<u>Mileage</u>	<u>Accident rate</u>	<u>Estimated damage</u>
Region 1	8	635, 002	12.6	\$ 540
Region 2	3	258, 202	11.6	125
Region 4	8	450, 919	17.7	1, 770
Region 5	3	117, 477	25.5	541
Region 7	6	313, 722	19.1	1, 993
Totals	28	1, 775, 322	15.8	\$4, 969

Vehicle accidents involving Job Corps staff: 6
 Vehicle accidents involving VISTA workers: 2
 Vehicle accidents involving enrollees: 20

* * * * *

VEHICLE ACCIDENTS

THE FOLLOWING TABLE SHOWS BUREAU VEHICLE ACCIDENT EXPERIENCE SINCE 1958:

<u>Year</u>	<u>No. of accidents</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
1968	97	2.6	\$13,313
1967	117	3.1	32,582
1966	125	3.1	26,771
1965	116	2.9	23,205
1964	114	2.8	36,410
1963	134	3.4	25,130
1962	125	3.4	33,100
1961	151	4.6	41,255
1960	75	2.7	32,960
1959	93	3.3	34,940
1958	146	4.9	37,980

*Number of accidents per million miles driven.

THE FOLLOWING TABLE COMPARES THE VEHICLE ACCIDENT EXPERIENCE OF MAJOR ORGANIZATIONAL UNITS OF RECLAMATION FOR CALENDAR YEAR 1968:

<u>Region</u>	<u>No. of accidents</u>	<u>Mileage</u>	<u>Accident rate*</u>	<u>Estimated damage</u>
Denver Office	1	429,543	2.3	\$ 0
Region 1	22	6,308,705	3.5	2,663
Region 2	17	8,606,285	2.0	2,933
Region 3	15	4,419,051	3.4	2,941
Region 4	6	3,782,838	1.6	591
Region 5	16	4,999,404	3.2	1,989
Region 6	7	4,376,301	1.6	1,393
Region 7	13	4,553,484	2.9	803
Totals	97	37,475,611	2.6	\$13,313
1967 Totals	117	38,275,475	3.1	\$32,582

*Number of accidents per million miles driven.

Note: Estimated damage covers only the cost of repair or replacement of the Government vehicle involved.

* * * * *

ACCIDENT COSTS

Accidents do not always involve personal injury to employees but may result in the destruction or loss of property and third-party claims. Consideration and review of costs resulting from accidents is essential to the appraisal of any accident prevention program. The following summary of estimated accident costs for calendar years 1968, 1967, 1966, and 1965 is presented for this purpose.

<u>Type of accident</u>	<u>1968</u>	<u>Estimated cost</u>		<u>1965</u>
		<u>1967</u>	<u>1966</u>	
Work injuries <u>1/</u>				
Disabling injuries	\$ 29,463	\$ 39,490	\$ 33,000	\$ 39,488
Nondisabling injuries	8,320	8,464	7,920	10,096
Fatal injuries	69,931	124,144	57,038	52,825
Fires	350	8,362	55,261	3,340
Tort claims <u>2/</u>	361,727	148,327	27,027	4,439
Employee claims	12		207	
Motor vehicle accidents	13,313	32,582	26,771	23,205
Other property damage	<u>20,410</u>	<u>6,024</u>	<u>2,232</u>	<u>16,054</u>
Totals	\$503,526	\$367,393	\$209,456	\$149,447

1/Cost estimate based on past 5-year average cost.

2/Tort claims resulting from accidents adjudicated during 1965, 1966, 1967, and 1968.

The costs shown are estimated direct costs resulting from accidents.

STUDIES CONDUCTED BY COMPETENT AND
RECOGNIZED AUTHORITIES INDICATE THAT
INDIRECT ACCIDENT COSTS EXCEED DIRECT
ACCIDENT COSTS BY A RATIO OF 4:1

* * * * *

PUBLIC SAFETY

RECORD OF PUBLIC DROWNINGS

<u>Bureau-operated Facilities:</u>	<u>CY68</u>	<u>CY67</u>	<u>CY66</u>	<u>CY65</u>
Canals	24	15	14	22
Reservoirs	4	4	1	3
Total	<u>28</u>	<u>19</u>	<u>15</u>	<u>25</u>

Facilities Operated by Others:

Irrigation and Water Districts	13	13	15	14
State or County (Recreational)	56	37	19	39
Total	<u>69</u>	<u>50</u>	<u>34</u>	<u>53</u>

Summary of Total Drownings During Period:

By Operating Agency:

Bureau of Reclamation	28	19	15	25
Irrigation and Water Districts	13	13	15	14
State or County (Recreational)	56	37	19	39
Total	<u>97</u>	<u>69</u>	<u>49</u>	<u>78</u>

By Type of Facility:

Canals	39	24	27	34
Dams	0	2	0	0
Reservoirs	58	43	22	44
Total	<u>97</u>	<u>69</u>	<u>49</u>	<u>78</u>

By Activity:

Swimming	26	21	15	23
Boating	21	13	6	14
Fishing	4	0	2	7
Fell into water	26	20	19	24
Other	20	15	7	10
Total	<u>97</u>	<u>69</u>	<u>49</u>	<u>78</u>

By Age:

Under 12 years of age	22	13	19	19
From 12 to 25	37	24	12	22
From 25 to 50	25	22	10	23
Over 50 years of age	13	10	8	14
Total	<u>97</u>	<u>69</u>	<u>49</u>	<u>78</u>

* * * * *

SAFETY AWARDS

COMMISSIONER'S ANNUAL SAFETY AWARD - 1968

Presented to Region 6, Billings, Montana, in recognition of the best safety record for Government forces during calendar year 1968.

NATIONAL SAFETY COUNCIL AWARDS

AWARD OF HONOR (1967)

Bureau of Reclamation--Bureau-wide
Region 2--Sacramento, California
Region 4--Salt Lake City, Utah

AWARD OF MERIT (1967)

Region 1--Boise, Idaho

NATIONAL FLEET SAFETY CONTEST (1967-1968)

Region 1, Boise, Idaho--Third Place--Government Truck Division,
City Group 1
Region 2, Sacramento, California--First Place--Government Truck
Division, City Group 1
Region 4, Salt Lake City, Utah--Second Place, Passenger Car
Division, Western Region, Group 1
Region 6, Billings, Montana--First Place, Passenger Car Division,
Western Region, Group 1

THE DEPARTMENT OF THE INTERIOR'S
CERTIFICATE OF SAFETY ACHIEVEMENT AWARD--1968

IN RECOGNITION OF OVER 500,000 MAN-HOURS WITHOUT A DIS-
ABLING INJURY:

Arbuckle Civilian Conservation Center (Staff)--Sulphur, Oklahoma
Casper Civilian Conservation Center--Casper, Wyoming
Columbia Basin Project--Ephrata, Washington
Palisades Power Field Branch, Minidoka Project--Burley, Idaho
Parker-Davis Project--Phoenix, Arizona
Phoenix Development Office--Phoenix, Arizona
San Luis Unit CVP Construction Office--Los Banos, California

IN RECOGNITION OF OVER 1,000,000 MAN-HOURS WITHOUT A DIS-
ABLING INJURY:

Fresno Field Division--Fresno, California
Weber Basin Civilian Conservation Center--Ogden, Utah

IN RECOGNITION OF OVER 500,000 ACCIDENT-FREE MILES:

Arbuckle Project--Sulphur, Oklahoma
Austin Development Office--Austin, Texas
Bernardo Field Office, Middle Rio Grande Project--Albuquerque,
New Mexico
Fresno CVP Construction Office--Fresno, California
Fryingpan-Arkansas Project--Pueblo, Colorado
Kansas River Projects--McCook, Nebraska
Lahontan Basin Projects Office--Carson City, Nevada
Las Cruces Irrigation Field Branch, Rio Grande Project--El Paso,
Texas
Red Bluff CVP Construction Office--Red Bluff, California
South Platte River Projects--Loveland, Colorado
Southern California Development Office--San Bernardino, California
Yuma Projects Office--Yuma, Arizona

IN RECOGNITION OF OVER 1,000,000 ACCIDENT-FREE MILES:

Elephant Butte Power Field Branch, Rio Grande Project--El Paso,
Texas
Region 3 Regional Office--Boulder City, Nevada
Rio Grande Project--El Paso, Texas
San Luis Unit CVP Construction Office--Los Banos, California
Tracy Field Division--Tracy, California

IN RECOGNITION OF OVER 2,000,000 ACCIDENT-FREE MILES:

CRSP Power Operations Office--Montrose, Colorado
Missouri-Oahe Projects Office--Huron, South Dakota

CONSTRUCTION SAFETY AWARD--1968

The Construction Safety Award is presented to contractors in recognition of exemplary safety records achieved while performing work for Reclamation. To be eligible, a contractor must have initiated and carried out an effective safety program during the term of his contract. He must have achieved a cumulative accident record lower than the average record obtained by all Bureau contractors during the preceding 3-year period. Equally important, he must have indicated a sincere interest in the safety of his employees by virtue of expending the time and effort necessary to carry out an aggressive and continuing safety effort. The following Bureau contractors earned Construction Safety Awards during 1968:

Abel Construction Company--Lincoln, Nebraska
Baker-Anderson Corporation--Santa Ana, California
Beasley Engineering Company--Emeryville, California
Brown-McKee, Inc.--Lubbock, Texas
Bushman Construction Company--St. Joseph, Missouri
Dominion Construction Company--Scottsbluff, Nebraska
Eagle Construction Corporation--Loveland, Colorado
Electrical Builders, Inc.--Valley City, North Dakota
Fredrickson & Watson Construction Company and Lord & Bishop, Inc.--Oakland, California
Gunther and Shirley Company and E. V. Lane Corporation--Sherman Oaks, California
Guy H. James Construction Company--Oklahoma City, Oklahoma
Kinetic Engineering and Construction, Inc., and B&A Electric Company, Inc.--Sacramento, California
Morrison-Knudsen, Utah, Brown and Root--Los Banos, California
Power City Construction and Equipment Company--Spokane, Washington
R. H. Fulton--Lubbock, Texas
R. J. Studer and Sons--Billings, Montana
Reece Construction Company--Scandia, Kansas
Strong Company--Springville, Utah
Syblon-Reid Company--Los Banos, California
United Structures, Inc.--Dolores, Colorado

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT

GOVERNMENT FORCES

4th QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH December 31, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
			CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR			
Washington Office	329	628,560					
Denver Office	1,409	2,841,280	1		11	0.4	4
REGION 1							
Boise Regional Office	180	295,694					
Baker Project	45	10,975					
Central Snake Project	38	79,232					
Chief Joseph Dam	314	80,996					
Columbia Basin Project	3	1,923,169	4		69	2.1	36
Green Springs Powerplant	47	4,036					
Hungry Horse Project	54	91,615					
Lower Columbia Development Office	4	89,470					
Lower Teton	69	9,829					
Mann Creek Project	59	1,972					
Minidoka Project	59	142,699					
Snake River Development Office	189	114,594					
Spokane Valley Project	47	2,584					
Third Powerplant Construction Office	20	173,562	2		150	5.4	402
Upper Columbia Development Office	29	91,006					
Wild Horse Dam	29	37,485					
Yakima Project	1,698	54,072	6		219	1.8	64
Totals & Averages		3,402,990					
REGION 2							
Sacramento Regional Office	578	1,295,617	1		3	0.8	2
Regional Drill Crews	41	84,268	1		100	12.0	1,202
Auburn-Folsom South Unit CVP Office	176	333,501					
Cachuma Operations Field Branch	2	4,080					
Central Coast Dev. Field Branch	4	6,603					
Fresno CVP Construction Office	128	225,332					
Fresno Field Division	145	283,632					
Folsom Field Division	72	147,346					
Klamath Project Office	17	40,190					
Lahontan Basin Projects Office	62	128,408	1		23	7.8	179
Napa Development Field Branch	3	6,020					
Red Bluff CVP Construction Office	32	80,020					
San Luis Unit CVP Construction Off.	128	467,284					
Shasta Field Division	142	282,493	1		27	3.5	96
Solano Operations Field Branch	3	4,152					
Tracy Field Division	159	329,511	1		26	3.0	79
Transmission Lines Office, Reno	4	12,262					
Upper North Coast Dev. Field Branch	100	8,067					
Willows CVP Construction Office	100	213,512					
Totals & Averages	1,836	3,957,838	5		179	1.3	45
REGION 3							
Boulder City Regional Office	189	353,200					
Boulder Canyon Project	141	304,816					
Dixie Project	5	10,176					
Mead Construction Office	26	51,033					
Lower Colorado River Project	193	37,312	1		83	2.8	232
Parker-Davis Project	317	631,222					
Phoenix Development Office	19	180,040					
Southern California Dev. Office	64	58,838					
Southern Nevada Water Project	7	98,945					
Transmission Lines Office	148	25,258					
Yuma Projects Office	148	300,844	1		90	3.3	299
Totals & Averages	1,202	2,422,284	2		173	0.8	71
REGION 4							
Salt Lake City Regional Office	228	457,627					
Central Utah Project	178	411,392					
Curecanti Unit	69	157,555					
CRSP Power Operations Office	267	543,037	2		33	3.7	61
Durango Projects Office	23	59,504					
Grand Junction Projects Office	46	104,778					
Logan Development Office	10	18,320					
Lyman Project	25	58,035					
Upper Green River Development Off.	21	35,804					
Weber Basin Project	32	102,520	1		17	9.4	150
Totals & Averages	899	1,956,173	3		50	1.5	26
REGION 5							
Amarillo Regional Office	105	205,942					
Albuquerque Development Office	32	68,713					
Arbuckle Project	47	3,520					
Austin Development Office	3	99,112					
Canadian River Project	2	41,461					
Lower Rio Grande Project	225	4,064					
Middle Rio Grande Project	76	446,065					
Navajo Project	20	171,602					
Oklahoma City Development Office	8	35,579					
Pecos River Project	235	12,241	2		24	4.5	54
Rio Grande Project	75	442,818					
San Juan-Chama Project	803	155,577	2		24	1.2	14
Totals & Averages		1,638,294					
CONSOLIDATED TOTALS							
TOTALS LAST YEAR (19)							

*FATALITIES INCLUDED IN TOTAL DISABLING

SAFETY PERFORMANCE RECORD
CUMULATIVE QUARTERLY REPORT
GOVERNMENT FORCES

4th QUARTER, 1968

PERIOD FROM JANUARY 1, 1968 THROUGH December 31, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL**	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 6							
Billings Regional Office	160	311,940					
Geology and Drill Crews	6	19,816					
Canyon Ferry Project	17	35,140					
Fort Peck Project	40	70,630					
Missouri-Oahe Projects	222	404,000					
Missouri-Souris Projects	264	435,699					
Power System Operations Office	51	99,280					
Riverton Project	5	9,479					
Upper Missouri Projects	82	174,104	1		6	5.7	34
Yellowtail Construction Office	25	59,861					
Yellowtail Project Office	31	60,346					
Totals & Averages	903	1,680,185	1		6	0.6	4
REGION 7							
Denver Regional Office	203	426,040	2		11	4.7	26
Fryingpan-Arkansas Project	182	423,880					
Glen Elder Unit	56	147,752	1		11	6.8	74
Kansas River Projects	96	192,256					
Niobrara-Lower Platte Dev. Office	28	60,632					
North Platte River Projects	235	475,509					
South Platte River Projects	160	331,652					
Totals & Averages	960	2,057,721	3		22	1.5	11
Average number of Government employees per month during 1968: 10,240							
CONSOLIDATED TOTALS	10,044	20,635,325	23		684	1.1	33
TOTALS LAST YEAR (1967)	10,395	21,341,433	57	2	14,182	2.7	665
*FATALITIES INCLUDED IN TOTAL DISABLING							
JOB CORPS CONSERVATION CENTERS							
Columbia Basin Job Corps Center							
Staff	54	225,672					
Corpsmen	170	1,018,992	1		1	1.0	1
Marsing Job Corps Center							
Staff	53	195,632	1		3	5.1	15
Corpsmen	129	833,704	1		11	1.2	13
Leviston Center (Deactivated)							
Staff (including VISTA)	4	49,888					
Corpsmen		107,408					
Toyon Job Corps Center							
Staff (including 2 VISTA)	50	292,040	3		69	10.6	245
Corpsmen	131	727,356	1	1	6,000	1.4	8,249
Collbran Job Corps Center							
Staff (including 1 VISTA)	37	81,032					
Corpsmen	92	495,464	1	1	6,000	2.0	12,085
Weber Basin Job Corps Center							
Staff (including 4 VISTA)	56	117,384	1		4	8.5	34
Corpsmen	207	1,107,072					
Arbuckle Job Corps Center							
Staff	33	195,812					
Corpsmen	117	624,432	4	1	6,010	6.4	9,628
Casper Job Corps Center							
Staff	54	289,856	2		39	6.9	135
Corpsmen	148	917,744	4		118	4.4	129
McCook Center (Deactivated)							
Staff		22,560					
Corpsmen		36,960					
TOTAL STAFF	332	1,428,296	7		115	4.9	81
TOTAL VISTA	9	32,580					
TOTAL CORPSMEN	994	5,870,132	12	3	18,140	2.0	3,090
CONSOLIDATED TOTALS	1,335	7,331,008	19	3	18,255	2.6	2,490
TOTALS LAST YEAR (1967)	1,678	9,958,392	23	2	12,487	2.3	1,254

SAFETY PERFORMANCE RECORD

CUMULATIVE QUARTERLY REPORT CONTRACTOR FORCES

4th QUARTER, 1968

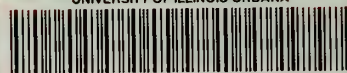
PERIOD FROM JANUARY 1, 1968 THROUGH December 31, 1968

REPORTING OFFICE	NUMBER OF EMPLOYEES (AVERAGE)	MAN HOURS	DISABLING INJURIES		DAYS LOST	FREQUENCY RATE	SEVERITY RATE
		CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	FATAL #	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR	CUMULATIVE THIS YEAR
REGION 1							
Baker Project		8,260					
Chief Joseph Dam	70	74,859					
Columbia Basin Project	184	311,319	5		95	16.1	305
Green Springs Powerplant	9	284					
Hungry Horse Project		103					
Lower Teton	3	6,831					
Mann Creek Project		1,071					
Minidoka Project		18,210	2		81	109.8	4,448
Snake River Development Office		5,001					
Spokane Valley Project		266					
Third Powerplant Construction Office	482	988,354	11	1	6,587	11.1	6,665
Wild Horse Dam	37	82,556	4		121	48.5	1,466
Yakima Project	6	14,503					
Totals & Averages	791	1,511,617	22	1	6,884	14.6	4,554
REGION 2							
Auburn-Folsom South Unit CVP Construction Office	80	88,424	1		85	11.3	961
Folsom Field Division		204					
Fresno CVP Construction Office	217	206,520	1		44	4.8	213
Fresno Field Division	35	3,417					
Lahontan Basin Projects Office	13	235,012	1		45	4.3	191
Red Bluff CVP Construction Office	36	114,746	1		130	8.7	1,133
San Luis Unit CVP Construction Off.	237	237,732					
Tracy Field Division		780					
Willows CVP Construction Office	130	262,243	2		115	7.6	438
Totals & Averages	748	1,149,078	6		419	5.2	365
REGION 3							
Boulder Canyon Project		2,234					
Lower Colorado River Project	11	87,600					
Mead Construction Office	37	97,461					
Parker-Davis Project	8	35,220					
Southern California Dev. Office		2,984					
Southern Nevada Water Project	104	63,856					
Yuma Projects Office	40	86,466	1		60	11.6	694
Totals & Averages	200	375,891	1		60	2.7	160
REGION 4							
Central Utah Project	179	449,627	4		97	8.9	215
CRSP Power Operations Office	2	11,880	1		30	84.2	2,525
Duracanti Unit	53	222,333	1		20	4.5	45
Durango	6	6,961					
Grand Junction Projects Office		1,408					
Kyman Project	28	107,205					
Upper Green River Development Office	14	11,103					
Weber Basin	38	38,139	1		6	26.2	157
Totals & Averages	320	848,656	7		143	8.2	169
REGION 5							
Amarillo Regional Office		5,895					
Arbuckle Project		2,541					
Canadian River Project	15	17,514					
Navajo Project	93	464,026	10		210	21.6	453
Pecos River Project	22	12,675					
Rio Grande Project		2,459					
San Juan-Chama Project	466	1,278,567	14	2	12,361	10.9	2,664
Totals & Averages	596	1,783,691	24	2	12,571	13.5	7,048
REGION 6							
Missouri-Oahe Projects	96	118,517					
Missouri-Souris Projects	47	43,015					
Riverton Project	8	11,182					
Upper Missouri Projects	104	217,830	1		13	4.6	60
Yellowtail Construction Office	57	142,538	4		65	28.1	456
Totals & Averages	312	533,082	5		78	9.4	146
REGION 7							
Pyramid-Arkansas Project	152	901,915	23	1	6,342	25.3	6,925
Glen Elder Unit	57	372,267	4	2	12,016	10.7	32,278
Kansas River Projects	13	26,412					
Nebraska-Lower Platte Dev. Office		3,274					
North Platte River Projects	50	53,925					
South Platte River Projects	3	1,268					
Totals & Averages	275	1,365,061	27	3	18,358	19.8	13,449
Average number of contractor employees per month during 1968: 3,755							
CONSOLIDATED TOTALS							
	3,242	7,567,076	92	6	38,513	12.2	5,090
TOTALS LAST YEAR (1967)	3,975	10,218,673	155	5	35,271	15.2	3,452

*FATALITIES INCLUDED IN TOTAL DISABLING

GPO 849-691

UNIVERSITY OF ILLINOIS-URBANA



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